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Evaluation of UNESCO Institute for Water Education (UNESCO-IHE)

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ABSTRACT

The UNESCO Institute for Water Education (UNESCO-IHE) became part of the UNESCO Water Family during the 31st session of the UNESCO General Conference and became operational in 2003. Before becoming a UNESCO Category I Institute, the IHE had functioned as a Dutch educational institution since its establishment in 1957. Its three main areas of work include postgraduate water education, research and capacity development for developing countries and countries in transition.

The evaluation responds to the official request for the completion of a statutory evaluation of UNESCO-IHE activities, jointly commissioned by UNESCO and the Government of the Netherlands. The evaluation assesses UNESCO-IHE performance between 2010 and 2015 across four main dimensions: relevance, effectiveness, complementarity and coordination. The report presents five recommendations along with strategic options for consideration with a view to strengthen the IHE's strategic positioning and performance in the future.

ACKNOWLEDGEMENTS

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The Evaluation Office would especially like to thank the members of the Evaluation Reference Group (including the representatives from the UNESCO Natural Sciences Sector, the Dutch Ministry of Foreign Affairs, the Dutch Ministry of Education, Culture and Science, and the Dutch Ministry of Infrastructure and Environment) for their insightful comments on the draft terms of reference and the draft evaluation report. A special acknowledgement also goes to the UNESCO-IHE Rector a.i. and Business Director for their contribution to the overall evaluation endeavour as well as all the whole Institute's staff for their continued support to the independent evaluation consultant throughout the evaluation process.

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Director, IOS

Photo on cover page: UNESCO

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ACRONYMS

ADB	Asian Development Bank
AfriAlliance	Africa Water Innovation Alliance
AWARENET	Arab Integrated Water Resources Management Network
BMGF	Bill and Melinda Gates Foundation
CINARA	Regional Centre on Urban Water Management for Latin America and the Caribbean
CKN-Indonesia	Collaborative Knowledge Network Indonesia
CML	Institute of Environmental Sciences (Leiden University),
Copernicus	Copernicus Institute of Sustainable Development (Utrecht University),
DGIS	Directorate General International Cooperation, the Netherlands
DUPC	DGIS UNESCO-IHE Programmatic Cooperation
DUPC 2	DGIS UNESCO-IHE Programmatic Cooperation (Second Phase)
ECTS	European Credit Transfer and Accumulation System
EQF	Education Qualification Framework
ES	Environmental Science
IHP-IGC	Intergovernmental Council
FAO	United National Food and Agriculture Organization
FB	Foundation Board
FTE	Full-Time Equivalent
GB	Governing Board
GIS	Geographical Information System
GoN	Government of the Netherlands
HR	Human Resources
ICCE	International Centre on Coastal Ecohydrology
ICHARM	UNESCO International Center for Water Hazard and Risk Management
IGRAC	International Groundwater Resources Assessment Centre
IHP	International Hydrological Programme
IT	Information Technology
ITC	Faculty of Geo- Information Science and Earth Observation (University of Twente)
IOS	Internal Oversight Service
IVM	Institute of Environmental Sciences
IWA	International Water Association
IWRM	Integrated Water Resources Management
KNMI	Royal Netherlands Meteorological Institute
LAWETNET	Latin American Water Education and Training Network
MRC	Mekong River Commission
MoU	Memorandum of Understanding
MSc	Master of Science
NCK	Netherlands Centre for Coastal Research
NCR	Netherlands Centre for River Studies
NICHE	Netherlands Initiative for Capacity development in Higher Education

NMP	Netherlands Environmental Assessment Agency
NUFFIC	Dutch Government Fellowship Agency
NVAO	Accreditation Organization of the Netherlands and Flanders
NWRC	National Water Resources Committee
OCW	Dutch Ministry of Education, Culture and Science
OECD	Organization for Economic Cooperation and Development
PPCP	Potential Conflict to Cooperation Potential Programme
PhD	Doctoral Degree
PPP	Public Private Partnership
PRoACC	Post-graduate Programme on Climate Change Adaptation in the Mekong River Basin
QF-EHEA	European Higher Education Area
RAMSAR	Convention on Wetlands of International Importance,
RCUWM	Regional Centre on Urban Water Management
RIVM	National Institute for Public Health and the Environment
RVO	Netherlands Enterprise Agency
CUSA	Integrated Approaches for Sanitation in Unsewered Slum Areas in Africa
SDG	Sustainable Development Goals
SENSE	Research School for Socio-Economic and Natural Sciences of the Environment
ToR	Terms of Reference
TU Delft	Technical University Delft
UNHCR	United National High Commission for Refugees
UNICEF	United Nations Children's Fund
UPaRF	UNESCO-IHE Partnership Research Fund
UTQ	University Teacher Qualification
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNESCO-IHE	The UNESCO-IHE Institute for Water Education
UVW	Association of Water Boards
WMG	Chair group Water Management (part of the Department Water Engineering & Management, University of Twente)
WIMEC	Wageningen Institute for Environment and Climate Research
WM	Water management
WMI	Municipal Water and Infrastructure
WSE	Water science & Engineering
WWAP	World Water Assessment Programme
WWDR	World Water Development Report
34 C/4	Medium-Term Strategy for UNESCO (2008-2013)
35 C/5	UNESCO's Programme and Budget (2010-2011)
36 C/5	UNESCO's Programme and Budget (2012-2013)
37 C/5	UNESCO's Programme and Budget (2014-2017)

EXECUTIVE SUMMARY

1. The UNESCO-IHE Institute for Water Education (UNESCO-IHE) became part of the UNESCO Water Family during the 31st session of the UNESCO General Conference in October 2001 and started its operations in June 2003. Before becoming a UNESCO Category I Institute, UNESCO-IHE had functioned as a Dutch educational establishment for nearly forty-six years (it was officially established in 1957). After more than half a century, the Institute is still located in Delft (the Netherlands) and its three main areas of work include postgraduate water education, research and capacity development for developing countries and countries in transition. In total, over 15,000 water professionals and postgraduate students from over 160 countries (mostly developing countries) have been studying and conducting research at UNESCO-IHE since its creation.

2. In response to Article 1.2 of the Operational Agreement UNESCO/OCW, and 38 C/Resolution 20 adopted by the UNESCO General Conference in November 2015, a statutory evaluation was requested in order to inform the negotiations leading to the renewal of the Operational Agreement between UNESCO and the Dutch Government (OCW), especially with regards to the continuation of the Dutch funding to the Institute for 2017 and 2018[1].

3. The Terms of Reference for this evaluation were developed jointly by UNESCO, OCW and the Dutch Ministry of Foreign Affairs with the aim to reflect on the UNESCO-IHE's performance across the following four main dimensions: relevance, effectiveness, complementarity and coordination.

4. The Evaluation identified the following main achievements:

- UNESCO-IHE's work is aligned with the UNESCO Natural Sciences Sector's priorities and strategies and is particularly relevant to the water community in developing countries and countries in transition, as well as to the Dutch Government (e.g., the Ministry of Foreign Affairs, the Ministry of Education, Culture and Science, and the Ministry of Infrastructure and Environment). UNESCO-IHE also contributes to the Agenda 2030 for Sustainable Development (e.g., SDG 6) through its global advocacy efforts for a more holistic and integrated vision of water, beyond the traditional view of water as a merely a technical area which only engineers should be interested in.
- Overall, UNESCO-IHE's work between 2010 and 2015 has produced positive outcomes in the three areas of education, research and capacity development, consistent with its original mission and objectives. That said, the Institute has the potential to succeed even further in carrying out its universalistic mission in the future.

Education Outcomes

- The quality of UNESCO-IHE's MSc. and Ph.D. programmes is high, as formally recognized by accreditation agencies and a number of other sources. Moreover, UNESCO-IHE's education work set itself apart from that done by other training institutions that offer water-related specialized courses and degrees for several reasons. First, the specific focus of its programme on developing countries and countries in transition. Second, the strength of its alumni network that includes mid-level professionals from developing countries who generally occupy water leadership positions once they return to their own countries upon completion of their UNESCO-IHE degree. Third, the balance between theory and practice in its curricula (students are constantly asked to apply their newly acquired technical skills to concrete water problems as part of their class group work and research assignments). Fourth, its dual degree programs which promote a more contextualized understanding of water issues.

[1] As indicated in UNESCO-IHE Annual Report 2014, p. 12; as well as in Article 1.2 and Article 5 of the Operational Agreement signed between UNESCO and OCW.

Research Outcomes

- UNESCO-IHE's research work is also quite exceptional in that it systematically focuses on the technical, political and social dimensions of complex water issues in developing countries and countries in transition.
- UNESCO-IHE's research stands out for three main reasons. First, its innovation-focus, which led to the invention of products in the past whose utilisation enhanced the use of and access to water in many different developing countries and countries in transition. Second, its close link with the Institute's capacity development mission: UNESCO-IHE created a new cadre of researchers from developing countries that either had no or limited prior research and publication experience before entering the programme. Third, the Institute's privileged access to national government sources and programmes on which to conduct research, in light of UNESCO-IHE's affiliation with the UN System.

Capacity Development Outcomes

- UNESCO-IHE's capacity development consists of hundreds of activities, closely aligned with the Institute's research and training programmes, whose primary objective is to equip individuals and organizations with better water management capabilities, competencies and skills in more favourable social and political environments.
- As far as its complementarity to the UNESCO Water Family as well as UN Water and the rest of the international water community, UNESCO's IHE has several strengths to offer. First, its strong network of water specialists with teaching, research and capacity development work experience, both in-house (over 500 between staff and guest lecturers) and outside (1,500-2,000). Second, its strong alumni network (over 15,000 individuals from over 100 countries who often occupy leadership positions in national and sub-national water agencies). Third, its ability to mobilize staff in the field within a reasonable period of time.
- As far as coordination is concerned, UNESCO-IHE's efforts in this area have been successful in view of the leadership role played by the Institute's staff vis-à-vis the numerous partners which it joined forces with in education, research and capacity development (e.g., through the establishment of joint and dual degree programmes in the case of education, the set-up of consortia funded by the Dutch Programmatic Cooperation Fund in the case of research, and the development of joint proposals with a host of specialized water companies, both within and outside of the Netherlands, in the case of capacity development).

5. The evaluation also identified the following main challenges:

- An appropriate balance among education activities, research, and capacity development at UNESCO-IHE was difficult to strike. While the three areas are currently understood as being interrelated and interdependent, the rather distinct division of roles and responsibilities amongst the Institute's staff working in one area or another led to a fragmentation of UNESCO-IHE's implementation and M&E efforts.
- A certain tension seems to exist between the necessity for the Institute's staff to "run after contracts" so as to deliver short-term advisory services and enhance the Institute's financial profitability, and the more general responsibility to enhance the quality of its academic programme and academic publications, as well as to fulfil its universal and equity-based mission spelled out in its Founding Document from 2003.
- The risk exists that the didactic coherence and the interdisciplinarity of the Institute's educational offering might decrease in the future due to the introduction of non-modular course options (almost all of them in English) that would allow external students to attend any course that they are interested in, according to their own sequencing preferences and without any necessary logic.
- It was often difficult for UNESCO-IHE to provide solid evidence on the societal impact produced by its own activities and programmes. That was partly due to the lack of both a fully developed intervention logic and adequate metrics to assess the legitimacy, relevance and influence of its work.

- The level of UNESCO-IHE's coordination with the UNESCO IHP Secretariat varied over the years. Despite UNESCO-IHE and IHP having similar strategic objectives, the differences in their respective modus operandi made collaboration between the two institutions somewhat challenging to establish and maintain on a continued basis.

6. Based on the conclusions presented above, the evaluation puts forward the following recommendations (the corresponding implementation modalities are discussed more extensively in the report's recommendations section):

Recommendation 1: UNESCO-IHE should continue to pursue activities, projects and programmes in education, research and capacity development making sure that all efforts in these three areas be strategically linked and complementary with each other as much as possible.

Recommendation 2: UNESCO-IHE should develop an intervention logic (e.g., theory of change) to provide a more comprehensive understanding of its work among its own staff and its external audiences. Ideally, the new tool, to be developed with the support of the whole staff, should include adequate indicators and benchmarks to better measure the impact (long-term results) of its education, research and capacity development work.

Recommendation 3: UNESCO-IHE should strike a balance between its own entrepreneurial business model and its universalistic and equity-based development mission and objectives.

Recommendation 4: UNESCO-IHE should make an effort to systematize the knowledge and experience accumulated by its staff working in education, research and capacity development in the past.

Recommendation 5: UNESCO-IHE should explore opportunities for better positioning itself vis-à-vis other international organizations, including within the UN System.

I. INTRODUCTION

1. 1 Background and purpose of the evaluation

7. The UNESCO-IHE Institute for Water Education (UNESCO-IHE) became part of the UNESCO Water Family during the 31st session of the UNESCO General Conference in October 2001 and started its operations in June 2003[2]. Before becoming a UNESCO Category I Institute, UNESCO-IHE had functioned as a Dutch educational establishment for nearly forty-six years (it was officially established in 1957). After more than half a century, the Institute is still located in Delft, the Netherlands, and its three main areas of work include postgraduate water education, research and capacity development for developing countries and countries in transition. In total, over 15,000 water professionals and postgraduate students from over 160 countries (mostly developing countries) have been studying and conducting research at UNESCO-IHE since its creation.

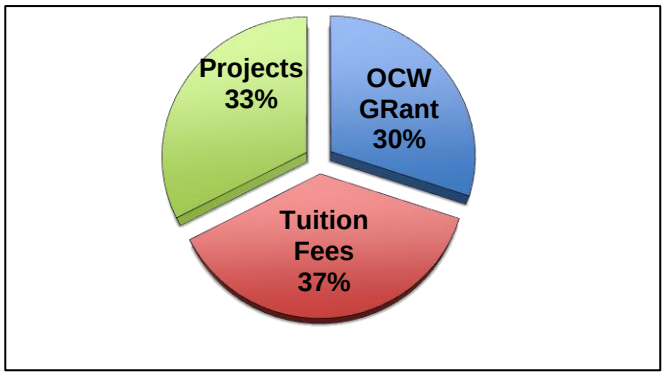
8. From a UNESCO standpoint, UNESCO-IHE has been relying on extra-budgetary funds since its creation: the exception being for the Institute's Rector and the Vice-Rector for academic and student affairs who are UNESCO employees, none of the Institute's staff salary is covered by UNESCO's regular budget. Historically, the annual base subsidy provided to the UNESCO Category I Institute by the Dutch Ministry of Education, Culture and Science (OCW) has represented the largest contribution to its regular functioning[3] (Table 1).

Table 1. Evolution of UNESCO-IHE Funding in 2010-2015 (ml €)

	2011	2012	2013	2014	2015	Average 2011-2015
OCW Grant	10,9	10,7	10,7	10,2	10,4	10.6
Tuition Fees	8,7	12,3	14	15,8	14,7	13.1
Projects	9,9	10,8	10,9	13,0	13,0	11.5
Other	3	1,7	0,5	0,5	1,5	1,4
Total	**32,5**	**35,5**	**36,1**	**39,5**	**39,6**	**36,6**

Source: *UNESCO-IHE Strategy 2015-2020 (2015); p.56; UNESCO-IHE Annual reports 2011-2015*.

Figure 1. UNESCO-IHE Funding (2011-2015)



Source: *Adapted from UNESCO-IHE Annual Reports 2011-2015*

[2] Although the UNESCO General Conference, at its 31st session in October 2001 (31 C/Resolution 16), adopted UNESCO-IHE Statutes as set forth in document 31 C/47, it took almost a year and a half before the newly created entity could become operational. UNESCO-IHE started functioning once the three following agreements were signed: (i) An Operational Agreement between UNESCO and the Government of the Netherlands; (ii) A Cooperation Agreement between UNESCO and the IHE Delft Foundation; and (iii) A Seat Agreement between UNESCO and the Kingdom of the Netherlands.

[3] The renewal of the OCW funding is subject to the performance requirements spelled out in the multi-year Operational Agreement signed between OCW and UNESCO.

9. However, starting in 2012 the tuition fees paid by students enrolled in UNESCO-IHE's academic programmes, along with the revenues generated through the implementation of research and capacity development projects[4], started accounting for the larger shares of the Institute's budget.

10. Partly as a reflection of its historical independence and unique funding model, the UNESCO-IHE claimed greater operational and financial autonomy than any other UNESCO Category I Institute[5] over the years, as also attested by its governance structure (Box 1).

Box 1. Overview of UNESCO-IHE Governance[6]

UNESCO-IHE governance structure consists of the five following functions: the Rectorate, the Governing Board, the Foundation Board, the Academic as well as the Process Management Units.

Rectorate: The day-to-day management of the Institute is handled by the Rectorate, which consists of the Rector[7] (this position is funded by UNESCO's regular budget), the Vice Rector of Academic and Student Affairs (vacant as of November 2015), and the Business Director. The Rectorate reports to the UNESCO-IHE Governing Board about programmatic issues and to the IHE Delft Foundation Board (as well as to the UNESCO Chief Financial Officer since 2013) on financial matters. The Rectorate provides leadership to three academic departments and six process management units.

Governing Board: The Governing Board (GB)[8] comprises representatives of ministries, universities and the private sector. The GB functions include the following: (i) to determine, within the framework decided by the General Conference, the general policy and the nature of the Institute's activities through a set of guidelines for the development of the Institute's programme; (ii) to adopt the programme of work and its budget estimates; (iii) to examine the biennial and other reports on the activities and expenditures of the Institute prepared by the Rector and to advise the latter on the execution, evaluation and follow-up of the Institute's programme and other matters he/she may bring to its attention; (iv) to monitor the implementation of UNESCO-IHE's mandate as per approval by the UNESCO General Conference. As of December 2015, the Governing Board composition was as follows 1) Netherlands-single appointment; 2) Netherlands-double appointment; 3) Netherlands-double appointment; 4) IHP-East. Europe (Poland); 5) IHP-LAC (Brazil); 6) IHP-AFR (Nigeria); 7) IHP-West. Europe & North America (Germany) (Turkey); 8) IHP-Arab States (Sudan); 9) IHP-Asia & Pacific (Japan) (Iran); 10) Private sector; 11) Agency; 12) Alumnus; 13) Professional international organizations; 14); Other: Rep of the DG.

Foundation Board: The IHE Foundation, as the legal entity for higher education, is responsible for granting the academic degrees of the Institute's educational programmes. The Foundation owns the buildings and facilities that UNESCO-IHE uses, and employs all UNESCO-IHE's staff (the Rector and the Vice-Rector are UNESCO employees). The IHE Delft Foundation Board, responsible for management of the Foundation, is also responsible for providing the Institute with the resources for the implementation of contracts with third parties. It consequently bears the financial risks and responsibilities on contractual matters (unlike other Category I Institutes where UNESCO has fiduciary responsibility for the funds raised in the name of the Institutes), and is responsible for safeguarding the continuity of the Institute's operations by overseeing the finances and ensuring proper embedding of the Institute in the Dutch legal systems.

Academic Departments: UNESCO-IHE has three Academic Departments with academic staff responsible for education, training and research programmes. These are the Environmental Engineering and Water Technology, Water Science and Engineering, and Integrated Water Systems and Governance departments. Each Academic Department is composed of Chair Groups, each of which is formed around a particular discipline or specialization.

Process Management Units: The work of the Academic Departments is supported by the Institute's Process Management Units. These include Central Services, the Education Bureau, Finance, Human Resource Management, IT, and the Office of the Rector.

Source: *UNESCO-IHE Annual Report 2014*; pp.7-8.

[4] As per the DGIS - UNESCO-IHE Programmatic Cooperation (DUPC), the Government of the Netherlands (Ministry of Foreign Affairs) provided an additional grant of €25 million for the implementation of projects in these two areas between 2008 and 2014 (DUPC Annual Report 2014, p. 1).

[5] UNESCO (2007) 34 C/47, Item 5.10 of the Agenda; p.2.

[6] It should be noted that at the time of the evaluation, there were ongoing discussions between GoN, UNESCO-IHE and UNESCO Headquarters on potential reforms of the governance framework.

[7] The Rector has been ad interim since September 2014. The Business Director has also been ad interim since then.

[8] Per the Institute's statutes (doc. 31 C/47, dated August 2001), Article IV.2: "six persons shall be elected by the Intergovernmental Council of the IHP, one for each electoral group of UNESCO" + Article IV.3 "seven persons shall be designated by the Director-General (…)".

11. As of late 2015, UNESCO-IHE staffing situation was as following: 177 (full-time equivalents), the majority of whom were permanent hires (69%), Dutch nationals (69%), male (58%) and academics (53%) (Table 2).

Table 2. Overview of UNESCO-IHE Staff (2010-2015)

	2010	2011	2012	2013	2014	2015
Nature of Employment						
Contract (FTE)	150	153	159	161	173	170
Seconded (FTE)	11	6	6	9	6	7
Total (FTE)	161	159	165	170	179	177
Contract Status						
Permanent Staff	73%	-	-	76%	69%	69%
Temporary Staff	27%	-	-	24%	31%	31%
Area of occupation						
Academic Staff	54%	55%	55%	53%	54%	53%
Non Academic Staff	46%	45%	45%	47%	46%	47%
Nationality						
Dutch	70%	69%	70%	69%	66%	69%
Foreign	30%	31%	30%	31%	34%	31%
Sex						
Female	38%	37%	37%	39%	41%	42%
Male	62%	63%	63%	61%	59%	58%

Source: UNESCO-IHE Human Resources Department

1.2 Purpose and scope

Evaluation use

12. The evaluation responded to the official request for the completion of a statutory evaluation of UNESCO-IHE activities, jointly commissioned by UNESCO and the Government of the Netherlands (Article 1.2 of the Operational Agreement between UNESCO and OCW; 38 C/Resolution 20 adopted by the UNESCO General Conference in November 2015)[9]. More specifically, this evaluation, to be completed by 1July 2016 is expected to provide inputs that could inform the negotiations on the renewal of the Operational Agreement between the Dutch Government (OCW) and UNESCO for the 2014-2018 period, especially with regards to the continuation of the Dutch funding to the Institute for 2017 and 2018[10]. The evaluation findings, especially those related to the gaps of the metrics currently used to monitor and evaluate the effect of UNESCO-IHE's programmes, were also expected to inform the content of an impact evaluation workshop, conducted by IOS in Delft on 28–29 June 2016.

[9] The Resolution requested the Director-General to submit to the Executive Board, at its 200th session, a new proposed version of the Operational Agreement between UNESCO and the Government of the Netherlands (and, if necessary, a revised version of the Statutes of UNESCO-IHE and a new proposed version of the Cooperation Agreement) pending the completion of an evaluation to be implemented in early 2016 and the demonstration of the Institute's positive outcome and a positive outcome of the negotiations between UNESCO, the Dutch Government and the IHE Delft Foundation.

[10] As indicated in UNESCO-IHE Annual Report 2014, p. 12; as well as in the Article 1.2 and article 5 of the Operational Agreement signed between UNESCO and OCW.

Evaluation scope

13. The evaluation mainly assessed UNESCO-IHE performance in education, research and capacity development in developing countries and countries in transition between 2010 and 2015, that is, during the following UNESCO programming periods: 35 C/5 (2010-2011), 36 C/5 (2012-2013) and 37 C/5 (2014-2017).

14. However, as the evaluation had to determine the UNESCO-IHE's overall level of contribution to the UNESCO Water Family over the years as well as the extent to which the Institute's work was aligned with the original mission assigned to it by the UNESCO General Conference in 2003, the time period covered by this evaluation included some of the UNESCO-IHE's earlier years. This was also made possible by the extensive amount of programmatic documentation and assessments conducted before 2010.

Key performance dimensions assessed by the evaluation

15. The evaluation focused on four main performance dimensions:

- Relevance: the degree of alignment between UNESCO-IHE's research, education and capacity development activities and: (i) the UNESCO medium-term strategy 2014-2021; (ii) the UNESCO-IHE's mission and objectives, as indicated in the Statute approved by the 31st UNESCO General Conference (hereinafter referred to as UNESCO-IHE Founding Document); (iii) the UNESCO-IHE's Strategy 2015-2020; and (iv) the Sustainable Development Agenda 2030.
- Effectiveness: UNESCO-IHE's results in terms of output delivery and outcome achievement in the three areas of research, education and capacity development. This included *inter alia* data collection and assessment of the quality of research and education activities. Particular attention was given to the academic and policy influence of its work, with a focus on developing countries and countries in transition.
- Complementarity: UNESCO-IHE's (potential) comparative advantage within the 'UNESCO Water Family', the Dutch Water Sector and the international water community.
- Coordination: the type and quality of UNESCO-IHE's leadership within the scope of partnerships and collaborations with other actors operating within the 'UNESCO Water Family', the Dutch Water Sector and the international water community.

Evaluation questions

16. The main evaluation questions covering the four dimensions were refined in collaboration with the evaluation reference group as contained in the approved Terms of Reference (see Annex 2).

1.3. Evaluation methodology

Overall approach

17. This evaluation was based on a mixed method design, combining the use of different quantitative and qualitative methods during the different phases of the evaluation. Field data collection was conducted between March and May 2016 by an independent expert in collaboration with the UNESCO Internal Oversight Service, and accompanied by advice, peer review and quality control of an Evaluation Reference Group, as well as other key stakeholders.

Intervention logic

18. A succinct visual representation of UNESCO-IHE's functioning (not only in terms of short-, medium- and long-term results but also in terms of key assumptions) was developed by the evaluator at the beginning of the evaluation (Figure 2). This tool provided the evaluator with a benchmark against which to assess all four evaluation dimensions. With respect to the content of the intervention logic, it is worth noting the following: (i) the intervention logic is indicative; (ii), items in bold have been adequately covered in this report; and (iii) those in italics have not been assessed thoroughly.

Figure 2. UNESCO-IHE Intervention Logic

UNESCO-IHE Activities	Short-term results (outputs)	Medium- term results (Outcome)		Long-term results (Impact)	Assumptions
EDUCATION Offering of 4 Master's degree programmes (total of 21 specializations), a Ph.D. programme, along with online specialized courses or professional diploma	-Students from developing and transition countries are enrolled in courses/programs that meet their countries' water-related technical needs -Students are taught by qualified university teachers	-Provide students with new water-related knowledge (both technical and development-related) *-Set standards for postgraduate water education programmes and continuing professional training programs*	The students' newly acquired knowledge is used to solve water-related issues effectively and efficiently in their own countries following their participation in the different UNESCO-IHE academic programs.	**Strengthen and mobilize the global educational and knowledge base for integrated water management** **Contribute to meeting the water-related capacity-building needs of the developing countries and countries in transition.**	-UNESCO-IHE and the IHP Secretariat work closely based on a clear definition of respective duties and responsibilities -UNESCO-IHE Alumni are capable of putting into practice in their day-to-day work the knowledge acquired at the Institute once they return to their own countries -The pedagogic approaches and the curriculum content are closely linked across the three areas of UNESCO-IHE work in education, research and capacity development Partnership development is not an end in itself but rather a means for enhancing UNESCO-IHE effectiveness and efficiency -As a UNESCO Category I Institute, UNESCO-IHE fulfils the mission and objectives agreed upon at the time it was created -The quality of UNESCO-IHE work complies with the highest research and education quality standards as well as capacity development good practices. -Regardless of the specific area of intervention, UNESCO-IHE work stays focused on developing and transition countries -In order to meet countries' needs, UNESCO-IHE programmes are designed based on adequate learning needs assessments
POLICY-ORIENTED RESEARCH Coordination and conduct of research in six main areas	-Quality Water management-related research is conducted by UNESCO-IHE Master's Degree students and Ph.D. fellows -Articles published in Peer-reviewed publications	*-UNESCO-IHE faculty and students assess water availability and use worldwide on a regular basis* -UNESCO-IHE Staff facilitate the exchange of information and knowledge on water availability and use	-The research widely disseminated and taken up by relevant institutions and policy-makers *- Policy-makers start managing water more effectively and efficiently*		
CAPACITY DEVELOPMENT Provision of tailored training and policy advice to agencies and entities responsible for the management of water-related services and programmes (e.g. World Water Forums, IWA, PPP forums)	-In-person and virtual training programs and technical assistance event are organized by UNESCO-IHE in response to specific in-country learning needs	-Strengthen national technical capacity in water management *-Promote good governance of water management processes* -Create and reinforce networks of water sector educational institutions	*-Organizations and governments participating in UNESCO-IHE capacity development programmes manage water more effectively and efficiently* -International Experts and professionals refer to UNESCO-IHE to exchange scientific, educational and technical information and knowledge in all aspects of integrated water management		

Source: Michele Tarsilla, 2016

Data collection and methods

19. The evaluation included the following methodological elements:

- Structured desk study of key programmatic documents (made available by UNESCO-IHE, IHP, and others) as well as previous reviews, evaluations, and performance assessments (Table 3):

Table 3. Recent reviews/evaluation of UNESCO-IHE

EDUCATION	NVAO, Accreditation Report of the UNESCO-IHE Masters in Water Management and Water Science and Engineering. The Hague, 2013a, NVAO, Accreditation Report of the UNESCO-IHE Masters in Municipal Water and Infrastructure The Hague, 2013b, NVAO, Accreditation Report of the UNESCO-IHE Masters in Environmental Science, The Hague, 2013c, NVAO, Accreditation Report of the UNESCO-IHE Education Quality Assurance System. The Hague, 2013d, NVAO, Institutional Quality Assurance Assessment of the UNESCO-IHE Masters in Water, The Hague, 2015, UNESCO-IHE, Students evaluation 2009-2015 Delft 2011. UNESCO-IHE Alumni tracer survey 2011, Delft 2011. UNESCO-IHE, Quality of Education at UNESCO-IHE: Self-reflection 2013, Delft, 2013.
RESEARCH	Endo, A.; Tsurita, I.; Burnett, K., and Orencio, P. (2015). 'A review of the current state of research on the water, energy and food nexus.' in Journal of Hydrology: Regional Studies. Gerritsma, W., Fest E., van der Togt, P.; Bibliometric analysis of SENSE 2007 – 2012, Wageningen, 2014. IOS, UNESCO-IHE Evaluation, 2007. SENSE, Assessment report on UNESCO-IHE, The Hague, 2009 SENSE, Assessment of SENSE Institutes: UNESCO-Institute of Water Education, The Hague, 2014. Tussen, R., Visser, M., Van Leeuwen, T. 2002. 'Benchmarking international scientific excellence: Are highly cited research papers an appropriate frame of reference?' In Scientometrics 54 (3): 381–397 UNESCO-IHE, Self-Evaluation Report 2007-2013 submitted to the SENSE Review Committee, Delft, 2014
CAPACITY DEVELOPMENT	DGIS (2013), External evaluation DGIS UNESCO-IHE Programmatic Cooperation (DUPC), 24 August 2013, DGIS, The Hague
EVALUATIONS OF ALL THREE AREAS	IOS, UNESCO-IHE Evaluation, Paris 2007 IOS, UNESCO-IHE Review, Paris 2013 IOS, Evaluation of Phase VII (2008-2013) of the International Hydrological Programme, Paris, 2014 IOS, Audit of UNESCO-IHE, Paris 2013, IOS, Risk Assessment of UNESCO-IHE, Paris, 2015 UNESCO-IHE, Draft Mid-Term Review 2008-2010, Delft 2011 UNESCO-IHE, UNESCO-IHE Annual Report, Delft 2010, 2011, 2012, 2013, 2014, 2015

- Intervention logic, articulating UNESCO-IHE main areas of work to key outputs and expected outcomes as well the major assumptions underlying these linkages.
- Semi-structured interviews (face to face/phone/Skype) with over 65 key stakeholders, including: UNESCO staff (ADG Science, IHP Secretariat staff; UNESCO-IHE staff), UNESCO-IHE students and alumni, the GB Chair, Dutch Government representatives (OCW, Netherlands Delegation at UNESCO, the Dutch Ministry of Foreign Affairs and Ministry of Infrastructure and Environment), UN-Water Members, institutional partners of UNESCO-IHE, water scholars (including Directors of institutes and research centres similar to UNESCO-IHE), decision makers in the field of water within and outside of the Netherlands.

- Three online surveys aimed to collect the feedback on the global reputation and perceived impact of UNESCO-IHE's education, research and capacity development programmes, and conducted among members of the UNESCO Water Family (IHP National Committees, as well as UNESCO water-related Centres and Chairs) as well as international water scholars and experts (teaching at academic institutions and international organizations – both and within the UN) and representatives of the Dutch water sector (Dutch consulting firms, water boards and companies providing technical assistance in the water sector to developing countries); and (d) a number of additional evaluation reports assessing the effects of UNESCO-IHE's work (e.g., the 2013 IOS Review, 2013 DUPC Mid-term Evaluation).
- Two missions to UNESCO-IHE in Delft (including meetings with Dutch government officials in The Hague) and one mission to Geneva, on the occasion of the launch of the Water Development Report during International Water Day celebrations held at the ILO headquarters on 22 March 2016.

Limitations of the evaluation

20. The low response rates to two of the three surveys administered as part of this evaluation (15% for the one conducted among the representatives of the Dutch Water Sector and 16% for the one completed by the international water scholars) posed a challenge. However, this limitation was mitigated by triangulation from several sources, including interviews to the greatest possible extent.

21. Previously undertaken reviews and evaluations did not always contain information that was suitable to address the evaluation questions (Annex 2).

22. The absence of a similar entity within the UNESCO Water Family did not allow for proper benchmarking or comparative analysis.

II. FINDINGS

Dimension one: RELEVANCE

Key Message

UNESCO-IHE's work is relevant and closely aligned with the UNESCO Natural Sciences Sector's priorities and strategies. It has been particularly relevant to the water community in developing countries and countries in transition as well as to the Dutch Government. UNESCO-IHE has specifically enhanced global understanding and the knowledge base of water issues, through the promotion of an integrated vision of water as articulated in SDG 6.

2.1. Relevance to UNESCO-IHE original mission and objectives (as stated in the Founding Document)

23. According to its Founding Document[11], UNESCO-IHE had a two-fold mission and seven key objectives to fulfil (Table 4)[12]. As of 2015, that is, twelve years after its establishment as a UNESCO Category I Institute, UNESCO-IHE still represented the largest concentration of water specialists in the world, and, in such capacity, it continued to pursue the UNESCO original vision ('Strengthening and mobilizing the global educational and knowledge base for integrated water management of the developing countries and countries in transition by also meeting their respective water-related capacity-building needs')[13] over the years.

Table 4: UNESCO-IHE Original Mission and Objectives

1. Within UNESCO's educational and scientific mandate, the mission of the Institute shall:
Strengthen and mobilize the global educational and knowledge base for integrated water management;
Contribute to meeting the water-related capacity-building needs of the developing countries and countries in transition.
2. To that end the Institute shall focus on the following objectives:
(a) To serve as a standard-setting body for postgraduate water education programmes and continuing professional training, building on the experience of the IHE and UNESCO' s International Hydrological Programme and any other relevant experience;
(b) To develop and deliver state-of-the-art education and research programmes, including postgraduate programmes and continuing professional training, making use of split-site programmes and distance learning, in all aspects of integrated water management to young, mid-career and senior professionals and decision- makers working with or within developing countries and countries in transition;
(c) To create and reinforce networks of water sector educational institutions, and to act as an international forum for experts and professionals to exchange scientific, educational and technical information and knowledge in all aspects of integrated water management by strengthening the capacities of its partners, such as regional educational and water sector institutions and organizations, with equal and complementary skills that can add to the overall knowledge base of the network and forums
(d) To contribute through research and education to the regular assessment of water availability and use worldwide and to facilitate the exchange of information and knowledge on water availability and use;
(e) To assist in studying educational problems in the field of integrated water management which emerge from programmes of assistance to developing countries;
(f) To assist international organizations, and global initiatives in the coordination and execution of the respective water-related programmes;
(g) To initiate and facilitate international policy dialogues on scientific and technical grounds on issues concerning water management.

Source: *UNESCO 31 C/4*

[11] UNESCO-IHE Statute was approved during the 31st session of the UNESCO General Conference in October 2001.

[12] Looking at the UNESO-IHE original mission and objectives was deemed necessary as tapping into an institution's historical memory (why the institution was created, under what circumstances, who were those institutions that most actively supported the institution's mandate) is usually key to programmatic stability and procedural consistency. That is especially true at a time when an institution is planning to review its coordination with other partners. In such cases, before introducing any change, it is beneficial to remind the institution's staff and other stakeholders of why the decision to join a new network was made, what the conditions were accepted as a result of such decision and what the related advantages were.

[13] According to the recent findings of an Alumni Tracer survey, 98% of the Institutes' MSc. graduates go back to their own countries and 80% of them are still in the water profession 20 years after graduation.

24. However, UNESCO-IHE's work was not only inspired to the original mission spelled out in the 2003 Founding Document. UNESCO-IHE's work was also influenced by the principles and values included in the operational strategies adopted by the Institute over the years. For instance, the most recent UNESCO-IHE strategy (*UNESCO-IHE Strategy 2015-2020*), which built upon a revised draft of the Institute's long-term strategy approved by the GB in November 2014 (*Strategic Directions UNESCO-IHE 2025*), assigned the Institute a new threefold mission as well as three overall objectives and seven specific objectives[14]. Although this more recent strategy did not alter the objectives included in UNESCO-IHE's Founding Document (Table 7), it introduced a few changes: a clearer focus on the need for closer links among the Institute's three areas of work (education, research and capacity development); a more distinct interest in creating impact on the ground; a strong call for better monitoring metrics and communication tools to report on the Institute's impact; and a renewed emphasis on increasing staff satisfaction and internal cohesion. The set of objectives included in the most recent UNESCO-IHE Strategy appeared well justified and relevant to the mission ascribed to the Institute for a variety of reasons: they were cognizant of UNESCO-IHE's functional autonomy as well as of the growing internationalization of the Institute's working environment; they also fully acknowledged the increasing international competition in water education, research and capacity development and, therefore, the need for seizing income-generating opportunities.

Table 7. UNESCO-IHE New Overall and Strategic Objectives (as of 2015)

Overall Objective 1: Maintaining and improving quality
Specific Objective 1. Maintain, or where needed, strengthen the quality of research, education and capacity development
Specific Objective 2. Focus activities, find synergies, e.g., in better linking education, research and capacity development.
Overall Objective 2: Expanding global presence and achieving stronger societal impact
Specific Objective 3. Create more value from and strengthen, where needed, our partnership for impact on the ground
Specific Objective 4. More effectively translate new technologies, developments and insights to address local needs
Objective 5. Better monitor and communicate our impact in education, research and capacity development
Overall Objective 3: Enhancing institutional resilience
Specific Objective 6. Become financially resilient in a changing economic and political climate
Specific Objective 7. Develop a transparent, open corporate culture, increased compliance with internal policies, laws and regulations
Specific Objective 8: Improve staff satisfaction and cohesion within the Institute

Source: Adapted from *UNESCO-IHE Strategy 2015-2020* (2015); pp.18-20.

25. The *UNESCO-IHE Strategy 2015-2020* departed[15] from one of the earlier institution-wide strategies approved in 2011 (The Strategic *Directions UNESCO-IHE in 2020)* which had envisaged the establishment of regional UNESCO-IHE institutes and the granting to the Institute of its own

[14] The Institute's vision of is 'a world in which people manage their water and environmental resources in a sustainable manner, and in which all sectors of society, particularly the poor, can enjoy the benefits of basic services'.

[15] In a later document produced by UNESCO-IHE in 2013 and preceding the development of the latest strategy, the Institute's mission seemed to be back in line again with what was the UNESCO General Conference had originally intended. UNESCO-IHE's mission was described as follows: "to contribute to the education and training of professionals and to build the capacity of sector organizations, knowledge centres and other institutes that are active in the fields of water, the environment and infrastructure in developing and transition countries" (UNESCO-IHE*b*, p.8). The same document added that the institute had "the UN mandate to play a global role in training a new generation of water professionals, facilitating the development of capable organizations and providing an enabling environment for well-informed decision-making that will improve water management practices in an integrated fashion. Related academic activities are mostly done in collaboration with partners worldwide, with a specific focus on developing and transition countries" (UNESCO-IHE*b*, p.8).

Ph.D. granting rights, something that had never been contemplated at the time UNESCO's General Conference approved the Institute's statute in 2003[16].

26. Overall, the activities and programmes implemented by UNESCO-IHE were relevant to all three overall objectives spelled out in the Strategy 2015-2020, as demonstrated by *inter alia*:

- the creation of an Education Bureau;
- the hiring of a Quality Assurance Manager;
- the compulsory quality certification of all UNESCO-IHE teaching and research;
- the creation of new short-term course; and
- the expansion of its capacity development portfolio, raising over a million euro between 2014 and 2015 to make up for the on-going donors' funding cuts.

27. Between 2010 and 2015, UNESCO-IHE's work was aligned with the mission assigned to the Institute at the time its Statute was approved by the UNESCO General Conference in 2001. Over the years, UNESCO-IHE staff engaged with hundreds of water professionals and institutions in all of UNESCO's regions so as to provide them with the necessary knowledge, technical competencies and policy advice to enhance their respective integrated water management practices. The noticeable fact that over 95% of the 14,500 UNESCO-IHE alumni returned to their home country after graduation and that, once they had been back, over 87% of them remained active in the water sector – generally in leadership positions – for many years (Alumni Tracer Study, 2011), attested to both the Institute's sound targeting and the usefulness of its academic curriculum.

28. UNESCO-IHE's contribution was all the greater if one takes into account the shortage of water and sanitation professionals in developing countries. For example, in Africa, which is one UNESCO's global priorities, 4,404 water professionals were needed in Tanzania and 56,000 in Burkina Faso to either monitor or contribute directly to the achievement of the water SDG (SIWI, 2012). This consisted with the 2005 ANSTI study showing that 40% of the posts in science and technology established across the African continent were vacant.

29. UNESCO-IHE also made a specific effort to mobilize the global educational and knowledge base of integrated water management, as indicated in its original mission. Consistent with the principles spelled out in the Berlin Declaration on Open Access to which it was signatory, UNESCO-IHE, for instance, established an Open Course Ware (OCW) facility that would make its staff lecture materials as well as the full text versions of all MSc. theses and specialized webinars available to the larger public at no cost (Box 2).

Box 2. UNESCO-IHE's contribution to a global knowledge base on Water Management

By the end of 2014, UNESCO-IHE made six courses available online to the public: Computational Hydraulics, Ecological Sanitation, Hydrology and Hydraulics, Open Source Software for Pre-processing GIS Data for Hydrological Models, Spate Irrigation Systems, and Urban Drainage and Sewerage. As of 2016, UNESCO-IHE had a plan to make all education materials freely available on OCW by 2017, in the form of lecture videos, notes and presentations. This initiative is in line with UNESCO-IHE's commitment to sharing knowledge with others in and outside the water sector to contribute to solving water problems the world is facing, as per the mission assigned to it by its Founding Document.

Source: *Adapted UNESCO-IHE Annual Report, 2014.*

30. With respect to UNESCO-IHE's overall objectives (Table 4), the Institute's work between 2010 and 2015 was relevant to the attainment of all of them), as suggested by the evidence gathered during this exercise.

[16] The same strategic document also assigned the Institute three main overall objectives: (i) Develop innovation, provide new knowledge, and promote the uptake of technologies and policies that will address the issues of the global water agenda, in particular those related to the Millennium Development Goals (MDGs) and the post 2015 Sustainable Development Agenda; (ii) Seek, evaluate and facilitate responses for the sustainable management of water, to meet the needs of all sectors of society, particularly the poor; and (iii) Strengthen and promote principles of good governance that drive institutional and management change to support the sustainable management of water.

31. The Institute made an effort to put in place a strong education and research programme that would help individuals, national institutions and international organizations in dealing effectively with some of the world's most complex water problems. In doing so, it fostered continued opportunities for dialogue and collaboration among its own staff, consistent with an interdisciplinary vision of water management and a holistic understanding of its key challenges and solutions. In parallel, the Institute recently engaged in specific activities that would allow it to:

- Standardize its education model and freely promote its replication at the global level (as envisaged in 2.a): the official accreditation of UNESCO-IHE's MSc. programmes and the increasing adoption of an open access publication policy, which would make its training materials available to a large public, represented two enabling conditions for more significant changes in this area in the future; and
- Create and reinforce networks of water sector educational institutions and act as an international forum of experts (an envisaged in 2.c): UNESCO-IHE certainly did so in the Netherlands and within the scope of some trans-boundary water projects as well as a few specific universities (whose choice was often based on funders' priorities) but it did not appear to do so systematically at the global level, as its UNESCO affiliation would have suggested.

32. The fulfilment of UNESCO-IHE's societal impact in the area of research was also attested by the 2014 SENSE evaluation, which assessed UNESCO-IHE's research as impressive due to its trans-disciplinarity and the active mobilization of its currents students (in the capacity of researchers) and alumni (in the capacity of co-researchers or commissioners) (Box 3).

Box 3. UNESCO-IHE Relevance: What the SENSE Assessment says

The mission of UNESCO-IHE dictates that partnerships be established with academic institutions, regional entities, United Nations Institutes, NGO's, banks etc. The list of achievements presented in this regard in the self-assessment report in which knowledge is transferred towards third world countries is very impressive. The crucial factor of the success achieved is the trans-disciplinary research design in which outreach (demonstration sites, policy briefs) is directly combined with research of the PhD students. Furthermore, the overall networking with alumni, integrating them into the education activities and encouraging their participation in the publications with IHE staff are very laudable".

Source: SENSE 2014, p. 62

2.2. Relevance to UNESCO's Mandate within the framework of the 'UNESCO Water Family'

33. Specific references to UNESCO-IHE could be found in a number of key UNESCO strategy documents: the 37 C/5 mentioned the Institute under Major Programme II (Natural Sciences) and referred to the Institute in relation to the Expected Results 11 and 12[17] under Main Line of Action (MLA) 5 ('Strengthening freshwater security'). UNESCO-IHE work was aligned with that conducted by the following UNESCO entities (Annex 4):

- The IHP Secretariat: UNESCO-IHE contributed to all the themes of the IHP's strategic plan (IHP-VIII for 2014-2021) entitled 'Water Security: Responses to Local Regional and Global Challenges', through its research on such topics as water-related disasters in a changing environment, eco-hydrology, climate change adaptation, urban water management, trans-boundary groundwater, and water governance.
- The national IHP committees: UNESCO-IHE actively contributed to the priorities and governments of a few national IHP committees, especially in those countries where the Dutch Government was implementing some large water programmes (e.g., Iran and Bangladesh).
- The Category II Institutes: (e.g., the International Center for Water Hazard and Risk Management in Japan, the Regional Centre on Urban Water Management in Teheran and the International Groundwater Resources Assessment Centre in Delft)[18]

[17] Expected Result 11: Responses to local, regional and global water security challenges strengthened; Expected Result 12: Knowledge, innovation, policies and human and institutional capacities for water security strengthened through improved international cooperation

[18] This occurred despite UNESCO's explicit normative requirements that called upon all Institutes and Centres to develop their work plans in a coordinated fashion with UNESCO's programme (short-term: current and next biennium) and the IHP's strategic plans (UNESCO, 2012b p. 6).

- The WWAP (World Water Assessment Programme): UNESCO-IHE's analytical research work and its continued effort to measure the availability and use of water resources around the world as part of its on-going research efforts were well aligned with the Perugia-based Institute whose mandate was focused on statistical monitoring and policy research). Within the scope of the latest World Water Development Report (WWDR 2016 "Water and Job"), UNESCO-IHE contributed two chapters: Chapter 12 on 'Addressing capacity development needs and improving dialogue'; and Chapter 16 on 'Scientific and technological innovation'; and
- The Water-Related UNESCO Chairs: UNESCO-IHE's work appeared particularly relevant to the Chairs' assigned mission: to enhance the institutional capacity building of academic institutions and research centres through knowledge-sharing on development-related issues with the larger public, such as non-governmental organizations and the private sector.

2.3. Relevance to Dutch Water Sector

34. The programmes implemented by UNESCO-IHE were undoubtedly of great relevance to the Dutch Water Sector mostly due to the impact that water has on the country's territorial morphology and the life of millions of people: 20% of the Netherlands' territory and 21% of its population are below sea level. The attention historically devoted to water-related issues across the Netherlands is such that the country has the world's both lowest per capita water usage and leakage losses in its water systems (Vewin, 2010).

Alignment with Dutch Universities' priorities and regulations

35. UNESCO-IHE's work was well aligned to that of the other Dutch universities that offer water-related educational programmes (e.g., TU Delft, Wageningen, VU Free University Amsterdam and ISS of Erasmus University at Rotterdam). The most frequently observed was that academic staff employed by UNESCO-IHE was also appointed at one of the other Dutch universities offering equivalent courses. In addition, the Institute shared facilities (e.g. library and lab space) and jointly offered some graduate courses in collaboration with some of these institutions.

36. Furthermore, UNESCO-IHE's work was relevant to the objectives of two specific Dutch education initiatives:

- The Platform for International Education, a Dutch association that promotes activities of institutes for higher education in the field of education and research capacity institutional strengthening in both developing and transition countries; and
- The Socio-Economic and Natural Sciences of the Environment (SENSE) Research School, a joint venture of the environmental research institutes of 10 Dutch academic institutes.

Alignment with Dutch non-academic organizations working in the water sector

37. UNESCO-IHE's work served sufficiently well the interests of those Dutch companies and organizations (consulting firms, research institutes, water boards, etc.) that requested its services over the last few years within the scope of research partnership or technical assistance programmes delivered to developing countries and countries in transition.

38. Based on the review of a sample of projects funded by Dutch donors and implemented by UNESCO-IHE either with or for Dutch organizations[19], three main factors were identified confirming the Institute's relevance to the Dutch sector. First, UNESCO-IHE's holistic understanding of water issues (e.g., including the broader political and ecological implications of water scarcity or water use) made UNESCO-IHE a premium partner for Dutch companies every time their work in developing countries entailed a close relationship with local government institutions. Second, in certain cases, when the work was done on trans-boundary water projects in areas where water sources were highly contested (e.g., in the proximity of conflict areas), the affiliation of a Dutch company with a UN-affiliated entity like UNESCO-IHE was critical for its technical fieldwork to be accepted as credible and impartial. Third, UNESCO-IHE's quick responsiveness and great agility to deploy staff on the ground within a reasonable period of time was a valuable asset to those Dutch

[19] The sample included a first batch 45 projects funded by RVO for a total of 4.5 million euro and a second batch of 17 projects funded by NWO for a total of 2.4 million euro.

companies involved in research and technical assistance assignments (80% of whom under the value of 50,000 euro) to developing countries funded by two Dutch organisations (NWO and RVO).

39. UNESCO-IHE is also a member of the Netherlands Water Partnership as well as of the Valorisation Programme Delta technology and water and, within the scope of such networks, the Instituted interacted with a variety of actors operating within the Dutch Water Sector (e.g., Deltares, WETSIS, and KWR or Water Cycle Research Institute). In addition, the Institute participated in several relevant Dutch and European research networks, including the Boussinesq Center for Hydrology, the Netherlands Centre for River Studies (NCR), and the Netherlands Centre for Coastal Research (NCK). Furthermore, besides working closely with national knowledge centres such as TNO, UNESCO-IHE contributed to the work conducted by the Royal Netherlands Meteorological Institute (KNMI), the National Institute for Public Health and the Environment (RIVM), the Netherlands Environmental Assessment Agency (NMP) and the Association of Water Boards (UVW). All of these networks played a crucial role in development and implementation of national and international research agendas.

40. Similarly, when surveyed in 2012 to assess the extent to which they had engaged with UN and Dutch organizations following their completion of studies at UNESCO-IHE, 50% of alumni (e.g. from Europe, North America and Oceania) stated that they had worked for or with a Dutch organization, in the capacity of either partner or consultant; whereas nearly 25% of the respondents from Africa and Asia confirmed to have worked for or with a Dutch organization, especially in the role of partner, after their period of study in Delft.

Alignment with Dutch governmental agencies

41. UNESCO-IHE contributed significantly to the Dutch government's agenda as its main area of focus (water) represented one of the five themes of excellence for the Dutch international cooperation.

42. *Alignment with the Dutch Ministry of Education, Culture and Science:* The Institute's contribution to the Dutch education system, which the ministry staff themselves value as excellent, was also officially recognized by the NVAO accreditation of the Institutes' educational programmes (UNESCO-IHE diplomas had a legal validity in the Netherlands since they were issued by the Dutch-based Foundation which was embedded within the Institute's governance structure).

43. *Alignment with the Dutch Ministry of Foreign Affairs:* UNESCO-IHE contributed to the five key water-related themes which the Dutch Ministry traditionally expressed special interest in: (i) efficient water management, particularly in the agricultural sector; (ii) Improved catchment area management and safe deltas; (iii) access to clean drinking water and basic sanitation, (iv) Water diplomacy; and (v) good governance (Table 6). In doing so, UNESCO-IHE was also actively involved through education, research and capacity development activities in the three areas that the Ministry considered priority: Mekong, Horn of Africa and the Arab Region (this is where 11 out of the 15 Ministry's partners run a number of water programmes). More recently, UNESCO-IHE's provision of services to countries where most of the immigrants arriving in Europe were coming from (e.g., the Middle East) responded to the Dutch government's increased need for tackling the current refugee crisis (5 million euro in the DUPC 2 are allocated to this area of work). The 2013 DUPC Mid-term evaluation confirmed such relevance of UNESCO-IHE work to the Ministry's foreign policy agenda.[20]

[20] The report especially stressed the quality of the work conducted by UNESCO-IHE's staff on the ground as well as the strong sense of ownership of the water strategies and newly acquired water management practices among the Institute's partners.

Table 6. UNESCO-IHE Relevance to DGIS

DGIS priority area	DGIS countries, catchment areas and deltas and cities
Efficient water management, particularly in the agricultural sector	Countries with whom the Netherlands had a water programme (as of 2014: Mali, Yemen, Rwanda, South Sudan, The Palestinian Territories, Bangladesh, Benin, Ghana, Indonesia, Kenya, Mozambique, Colombia and Vietnam).
Improved catchment area management and safe deltas	At least eight catchment areas and deltas in Bangladesh, Benin, Ghana, Indonesia, Kenya, Mali, Mozambique and Vietnam. At least six large cross-border catchment areas, groundwater systems and deltas (Brahmaputra, Incomati, Mekong, Senegal, the West Bank Aquifer and Zambezi).
Access to clean drinking water and basic sanitation	At least eight countries, including Bangladesh, Benin, Ghana, Kenya and Mozambique. At least 10 cities to include Accra, Cotonou, Ho Chi Minh City, Jakarta and Parakou.
Good governance	Five catchment areas (Brahmaputra, Niger, Nile, Senegal and the West Bank Aquifer) and give countries (Benin, Kenya, the Palestinian Territories, Rwanda and South Sudan)
Water Mondiaal countries	Bangladesh, Egypt, Indonesia, Mozambique, Vietnam, Colombia and Myanmar

Source: Water for Development, 2012 and Water Mondiaal.

44. Through the support of the DGIS-UNESCO-IHE Programmatic Cooperation (DUPC), UNESCO-IHE Institute also contributed to the Dutch development cooperation and trade agenda and objectives of the Ministry of Foreign Affairs (more specifically, the Ministry's Directorate-General for International Cooperation). Between 2008 and 2014, the Institute conducted 103 integrated research activities, involving over 85 partner institutes from almost 40 developing countries and countries in transition and around 30 institutes from developed countries, including at least 15 from the Netherlands. As part of this 22 million contract awarded by the Ministry, the Institute generated new knowledge in some of the Ministry's priority areas of interest, such as in the case of the two following projects: the 'Integrated Approaches for Sanitation in Unsewered Slum Areas in Africa (SCUSA)' and the 'Post-graduate Programme on Climate Change Adaptation in the Mekong River Basin (PRoACC)'. In addition, the Institute's lines of research were consistent with the eight Ministry's priority research and innovation themes (e.g., water quality and treatment, energy recovering, drinking water and water for industrial use)[21].

45. Likewise, UNESCO-IHE contributed to the implementation of the Dutch Ministry of Foreign Affairs' water search cooperation in such African countries as Benin, Ghana, Kenya, Mali, Mozambique, Rwanda and South Sudan. By conducting a water needs assessment in the seven countries' capitals, UNESCO-IHE managed to identify twelve water-related areas of priority support which this programme (Via Water) along with Dutch competent authorities within the Ministry would concentrate as of 2015. In these very same countries, UNESCO-IHE also became a privileged intermediary between the Dutch Government and the rest of the UN System.

46. *Alignment with the Dutch Ministry of Infrastructure and the Environment*: This Ministry, which had partnered with the Ministries of Foreign Affairs and Economic Affairs within the scope of an International Water Cluster, renewed a MoU with UNESCO-IHE every four years since 2003 and, as a result, it benefited from the Institute's technical support for over a decade. Their partnership specifically revolved around the funding and implementation of 24 different projects spanning across three different areas:

- The development of 'Policy and Governance for Climate Adaptation' strategies of Deltas within the River Basin (Water Mondiaal) and within the scope of other similar international initiatives (UN, Water Coalition, SDGs);

[21] A new phase of this cooperation started in 2015 under the name of DUPC2.The objective of DUPC2 is produce more tangible development impacts in the water sector through more solids partnerships in the water sector between academic and non-academic actors in the areas of research and capacity development in developing and transition countries.

- The innovation of Delta technology and Water Technology as well as the development of new ports (falling under the Ministry's Innovation Programme); and
- The Sustainable Economic Cooperation agenda of the Dutch Government (Top Sector Water Dutch development cooperation countries, catchment areas and deltas, and cities (Water for Development, 2012 and Water Mondiaal).

47. UNESCO-IHE's work was also aligned with the Dutch Government's overall strategy to contribute to the 2030 Agenda, thanks both to its education and research efforts in such areas as water diplomacy and its capacity development programmes (aimed at both Dutch and foreign experts), besides its focus on the socio-cultural and economic aspects of water management.

2.5. Relevance to Sustainable Development Goals

48. UNESCO-IHE's work is also aligned with UNESCO's commitment to contribute to the development of the UN 2030 agenda. That is especially true in relation to SDG 6 ('Ensure availability and sustainable management of water and sanitation for all')[22] in that the Institute stressed the multifaceted significance of water on the fulfilment of the UN 2030 Agenda. UNESCO-IHE contributed to making the international community understand that water is not all about water and sanitation or technology but it is also, and foremost, about education and capacity building as well as governance and stakeholder engagement at all levels, as advocated by UNESCO-IHE staff at a number of international fora (IWA World Water Congress or the OECD Water Governance Initiative) and in the chapters that UNESCO-IHE staff wrote for the WWDR in 2015 and 2016. In this vein, the work of one UNESCO-IHE staff (van Dijk, 2014) discussing the potentially positive role of the private sector towards the attainment of the SDG is quite exemplary.

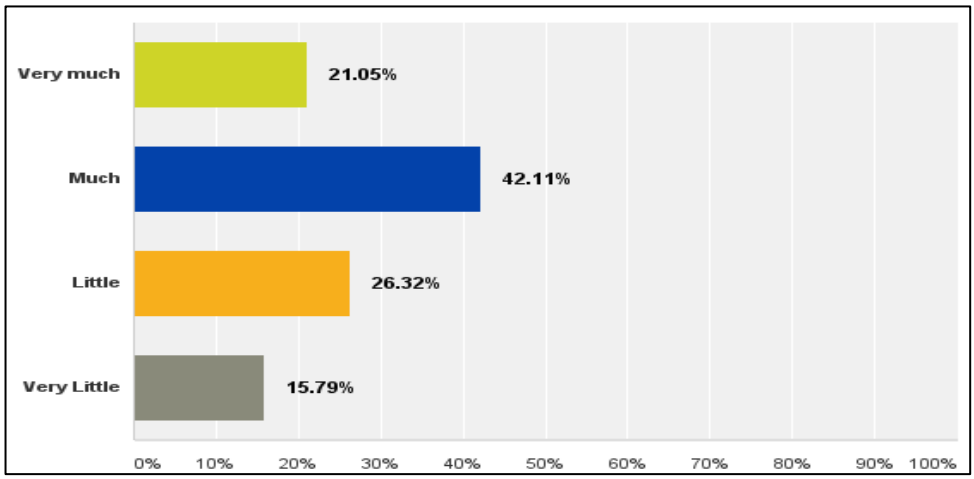
49. More specifically, the content of the research conducted by UNESCO-IHE was focused very much on the nexus existing between water and a variety of other SDG, such as:

- SDG 2 on food security (given that 70% of all fresh water use is by irrigation and that irrigated agriculture supports 40% of all food production or that drought is the number 1 threat to food supply, UNESCO-IHE promoted research and capacity development on water harvesting techniques, better forecasting);
- SDG3 on good health and well-being (UNESCO-IHE research demonstrated that, thanks to the innovation brought about by innovative products that allowed to purify water and made reliable water sources more accessible, mortality rates dramatically decreased, especially among children and women)
- SDG 8 on decent work and economic growth (UNESCO-IHE staff contributed two chapters to the 2016 WWDR report on Water and Jobs according to which 78% of the total workforce, that is, 2.5 billion people, were dependent on water);
- SDG 13 on Climate Action and SDG 15 Life on Land (UNESCO-IHE's willingness to contribute to the adoption of climate change mitigation measures was attested by its effort to: (i) establish a new Erasmus Mundus Joint Master Programme on Groundwater and Global Change in 2015; (ii) start a new the Fellowships programme 'Strengthening Small Island Developing States' capacity in the water sector to cope with the effects of climate change, and (iii) convene a panel on Capacity Development in Water and Climate at the COP21 during Water and Climate Day, and
- SDG 16 on Peace, Justice and Institutions (UNESCO-IHE promoted graduate-level training on water diplomacy, such as in the case of the joint short courses organized with the Oregon State University, and its staff contributed directly to the development and implementation of trans-boundary water projects.

50. The positive contribution of UNESCO-IHE's work to the current international discourse on water as well as contemporary policy-making in the water sector was also confirmed by the well-recognized international water scholars responding to the survey. When asked to what extent UNESCO-IHE impact global water policies, 62% of them (*n*=15) stated that UNESCO-IHE has impacted either much or very much (Figure 3).

[22] http://www.unwater.org/sdgs/from-mdgs-to-sdgs/en/

Figure 3. UNESCO-IHE' work impact on global water policies: International Scholars' perceptions



Source: *Author, 2016*

Dimension two: EFFECTIVENESS

51. This section is an assessment of the outputs and outcomes of UNESCO-IHE's work in the education, research and capacity development area, as articulated in UNESCO-IHE's Founding Document and UNESCO-IHE's more recent strategies. An indicative intervention logic was specifically developed as part of this evaluation (Figure 2). The elements of the intervention logic were further assessed through the evaluation survey findings as well as a number of past reviews and assessments.

2.6. Education

Key Message

The quality of UNESCO-IHE's MSc. and Ph.D. programmes is high, as formally recognized by accreditation agencies and a number of other sources. UNESCO-IHE's education work set itself apart from that done by other training institutions that offer water-related specialized courses and degrees for several reasons. First, the specific focus of its programme on developing countries and countries in transition. Second, the strength of its alumni network which included mid-level professionals from developing countries who generally occupy water leadership positions in their own countries. Third, the balance between theory and practice in its curricula. Fourth, its dual degree programmes which promoted a more contextualized understanding of water issues.

2.6.1. Key achievements (Outputs)

52. Between 2010 and 2015, UNESCO-IHE offered four Master's degree programmes (Water management, Urban water and sanitation, Water science & Engineering and Environmental Science) and 21 specializations[23] (Box 4).

Box 4. How do UNESCO-IHE MSc programmes work?

The UNESCO-IHE MSc. programmes have a modular structure and comprise 12 taught modules, most of which take three weeks and are worth five European Credit Transfer and Accumulation System (ECTS) credits. A research period of six months concludes the programmes. The total study load of the MSc. programmes is 106 ECTS credits over a total duration of 18 months; 10-15% of the students per batch get an extension (usually 1-2 months) granted by the Examination Board) to complete their MSc. research due to various reasons, such as illness, problems during data collection, etc.

Source: *UNESCO-IHE,* 2013b, p.14

[23] The number of specializations delivered by UNESCO-IHE in partnership with other institutions grew rapidly over the years: they were only three in 2009 and went up to thirteen by the end of 2012.

53. On average, 90% of MSc. students (average number per year between 2010 and 2015: 180) came from developing countries and countries in transition, which was consistent with its original mission and objectives (Table 8).

Table 8. Enrolment in MSc. programmes and specializations (2009-2016)

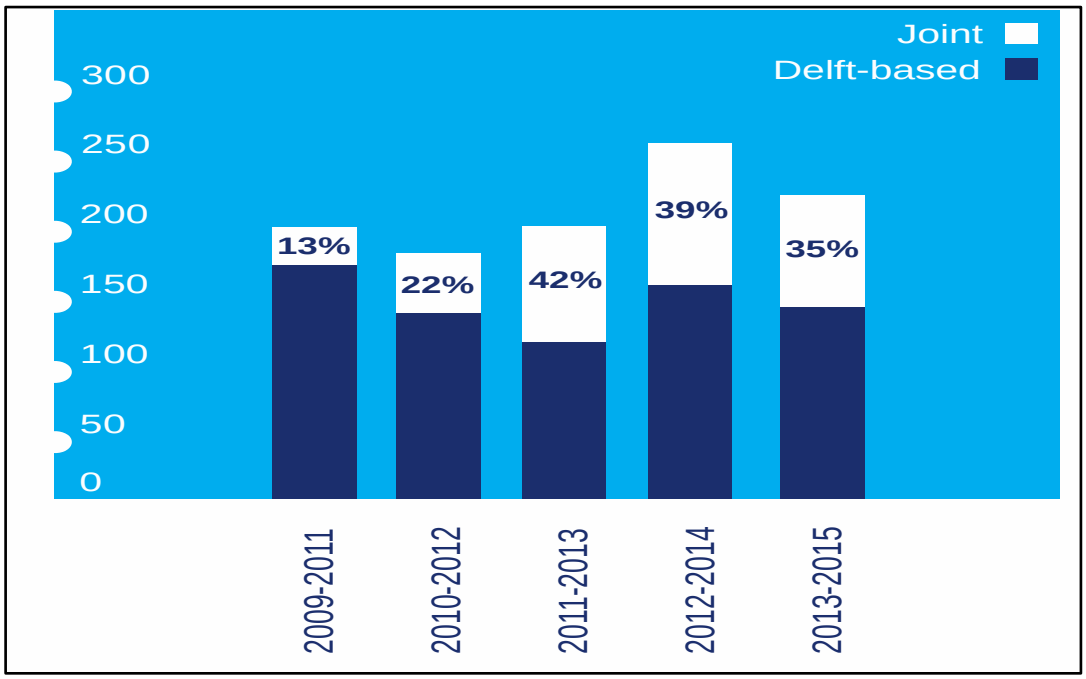
Cohort	WSE	MWI	ES	WM	Total
2009-2011	76	42	56	28	202
2010-2012	78	35	38	34	185
2011-2013	85	40	53	24	202
2012-2014	101	57	72	29	259
2014-2015	84	39	55	37	215
2015-2016	107	38	56	33	234

Legend: WSE=*Water science & Engineering*; WMI=*Municipal Water and Infrastructure (today Urban water and sanitation*); ES=*Environmental Science;* and WM=*Water management*

Source: Adapted from UNESCO-IHE Annual Reports (2010-2016)

54. On average, 40% of MSc. students were enrolled in joint specializations developed by UNESCO-IHE in collaboration with other academic institutions, including in the Global South[24] (Figure 3). Such partnerships allowed UNESCO-IHE to offer courses whose curricula would include region-specific knowledge that would have been impossible to integrate otherwise. Besides reducing the financial and social costs for students (and their sponsors) to attend the training, the creation of joint academic programmes allowed professionals in developing countries and countries in transition to learn about water-related issues in a more contextualized manner (in line with the principles of embedded learning).

Figure 3. Percentage of UNESCO-IHE MSc. students enrolled in Joint Degree/Specializations



Source: *UNESCO-IHE Annual Report, 2014*

[24] These include both Dutch Universities (e.g. Wageningen University and Delft Institute of Technology) and academic institutions outside of Europe (e.g. Universidad del Valle in Colombia, Oregon State University in the US, Egerton University in Kenya, Kwame Nkrumah University in Ghana, and the University of Peace in Costa Rica).

55. In 2010-2015, UNESCO-IHE also delivered short courses (in addition to its standard MSc. programmes) to over 1200 individuals (90% of them from developing countries)[25] as well as online specialized courses[26] (an average of 9 per year) to over 500 water specialists (65% of them from developing countries) (Table 9). More recently, and consistent with the principle of lifelong education promoted by the UNESCO Education Sector, UNESCO-IHE started offering refresher seminars to alumni between 2000 and 2015.

Table 9. UNESCO-IHE Education Work: Key outputs (2010-2015)

Year / Development relevance and valorization	2011	2012	2013	2014	2015
MSc graduate per year (No.)	189	175	184	238	186
Short course participants per year (No.)	389	359	378	585	846
On-line course participants per year (No.)	74	105	122	147	165
MSc. programmes intake (% from developing countries)	83	86	90	91	88
Short courses intake (% from developing countries)	94	93	89	89	85
On-line course intake (% from developing countries)	72	59	65	65	49
On-line course offering (No.)	3	9	9	9	10
International academic staff (%)	48.8	47.8	46	52	47.9

Source: Adapted from *UNESCO-IHE Annual Reports 2011-2015*

56. UNESCO-IHE also offered a Ph.D. programme, with an annual average of 132 registered PhD fellows, 89% of whom came from developing countries (Table 10).

Table 10. UNESCO-IHE Ph.D. Education: Key features

Year / Number	2011	2012	2013	2014	2015
PhD students (No.)	123	131	139	136	130
PhD graduations per year (No.)	10	16	17	16	26
PhD graduates from d/t countries (%)	93	93	93.8	75	84.6

Source: *Adapted from UNESCO-IHE, Annual Report 2014.*

57. As UNESCO-IHE does not have the right to promote Ph.D. students according to the Dutch Higher Education Act, its Ph.D. students' defences are generally held in collaboration with an internationally renowned university between 2010 and 2015. As a result, each UNESCO-IHE Ph.D. student's defence was co-chaired by two rectors, and the Ph.D. degree bore the logos and signatures of the partner university as well as UNESCO-IHE. Overall, such partnerships with Ph.D.-granting universities enhanced the quality of UNESCO-IHE doctoral programme, as all the professors involved in it had to receive a formal appointment with a recognized Dutch university before being able to teach; likewise, the UNESCO-IHE Ph.D. fellows could be more confident about the validity of their studies as they were formally registered at one established national university (UNESCO-IHE, 2014, p. 24). In addition, the fertile cooperation with the Higher Education System in the countries opened up options for a permanent adaptation to its academic standards and finding new and innovative solutions.

58. Unlike the period 2003-2010 when all students attending UNESCO-IHE were funded by Dutch Government fellowships (NUFFIC), sources of fellowship funding started getting diversified between 2010 and 2015. On the one hand, UNESCO-IHE partnered with the Erasmus Mundus

[25] As of 2015, the Institute was already planning to merge short course in a kind of summer-school programme with 'a la carte course selection' for additional revenue-generation purposes.
[26] In 2012, the Institute started offering a fully online Postgraduate Professional Degree in Sanitation and Sanitary Engineering, thanks to the funding of the Bill and Melinda Gates Foundation).

program (funded by the European Union) towards the establishment of a Joint Doctorate in Environmental Technologies for Contaminated Soils, Sediments and Solid Waste in 2012. On the other hand, the Institute partnered with a variety of organizations (e.g., the Rotary Foundation and the World Meteorological Organization) that would provide sponsorship of an increasing number of students.

2.6.2 Key Achievements (Outcomes)

Education Quality

59. As the completion of a high quality educational programme with an applied and transdisciplinary approach is likely to influence the effectiveness and impact of students' work in the future, a review of UNESCO-IHE education quality was key to better understand the Institute's effectiveness and its potential to produce societal impact. In this vein, the argument that UNESCO-IHE students were able to effectively contribute to the development processes of their countries and regions based on the quality of the Institute's educational programme was supported by four sources:

- the formal accreditation of UNESCO-IHE's education quality;
- the list of quality standards that all UNESCO-IHE academic and guest lecturers needed to comply with in order to be able to teach at the Institute;
- the academic programme evaluations completed by the different student cohorts between 2010 and 2015; and
- the survey among the UNESCO Water family members conducted as part of this evaluation.

Formal accreditation

60. The Accreditation Organization of the Netherlands and Flanders (NVAO) attested the quality of UNESCO-IHE education[27] in 2013. The accreditation report concluded that the content and the quality of Institute's four MSc. programmes were equivalent to those offered by other European and Dutch schools[28] (Table 11).

Table 11. NVAO Accreditation Evaluation (by MSc.)

NVAO Assessment by Master programme (2013)*	Learning Outcomes	Teaching-learning environment	Staff/Student Ration
MSc. in Water Management	Good	Good	1:10.5 for taught part; 1:23.6 for the master supervision
Special Remarks by the Review Committee: Benchmarked with other similar programmes in Netherlands and Europe, this programme is special in light of the target group of mid-career professionals, its development orientation and the diverse background of the students who enrolled in this programme (a large part are BA graduates in public administration, law or economy). The average thesis marks attributed by UNESCO-IHE staff are at the same level as those allocated by staff at other Dutch Universities (e.g., Delft University of Technology, Wageningen University and the VU University of Amsterdam).			
MSc. in Water Science and Engineering	Satisfactory	Satisfactory	1:8.9 for taught part; 1:23.3 for the master supervision

[27] The accreditation, valid for an initial period of three years, was extended to six years following the completion of an institutional audit in 2014, which resulted in a verdict of 'positive with conditions' (UNESCO-IHE Annual Report, 2014, p. 19). In an effort to follow-up on the NVAO recommendation, UNESCO-IHE put in place a series of procedures and tools aimed at enhancing the quality of education at the Institute, also in accordance to the vision and principles spelled out in the Vision on the quality of education introduced by the Institute's staff in 2013.

[28] The positive judgement rendered by the assessment committee was based on information provided by UNESCO-IHE in a critical reflection paper prepared by its staff as well as on the review of a sample of these, a number of study visits and interviews conducted with staff, students and graduates. Overall, the assessment was grounded on three key standards: intended learning outcomes; technical learning environment; assessment and achieved learning outcomes (NVAO Accreditation, 2013, pp. 3-7).

Special Remarks by the Review Committee The progamme is unique in the world as its combines hydraulic engineering, hydrology and hydro-informatics (all other programs only focus on 1 of the three). Hydro-informatics is important for all other master programmes, as well.			
MSc. in Municipal Water and Infrastructure	Satisfactory	Satisfactory	1:10.3 for taught part; 1:21.4 for the master supervision
Special Remarks by the Review Committee: Compared with other institutions offering similar programmes in environmental engineering: UNESCO-IHE is unique in including the requirement for working experience in the admission procedure and focusing on mid-career professionals from developing countries and countries in transition.			
MSc. in Environmental Science	Satisfactory	Satisfactory	1: 9.7 for taught part; 1:22.5 for the master supervision
Special Remarks by the Review Committee: The programme's learning outcomes are comparable to those of other MSc. programmes in Environmental Science. These include the Vrije Universiteit Amsterdam, Open University, Wageningen University, University of Edinburgh and University of London Queen Mary's College. On the other hand, the focus on water issues and on developing countries makes the Environmental Science at UNESCO-IHE different from most comparable Environmental Science programmes.			

Source: Adapted from *NVAO, 2013; NVAO, 2015*

Education quality requirements for teachers and guest lecturers

61. The NVAO accreditation of UNESCO-IHE training model's quality was key to enhance the Institute's international academic standing and built on the efforts made by the Institute in the past to bring its academic programme to par with those of other universities, especially in Europe. The 18-month MSc programmes (12 months in-house and 6 months of research work) offered by UNESCO-IHE, for instance, had already been compliant for years with the formal requirements which all other European academic institutions were subject to (e.g., meeting the Level 7 descriptors of the European Qualification Framework, also known as Dublin descriptors[29], as endorsed by the Bologna Protocol, and adhering to the competencies outlined by the Education Qualification Framework (EQF) of the European Higher Education Area (QF-EHEA)[30].

62. Despite the positive conclusions of the 2013 NVAO assessment, the NVAO Committee judged the Institute education quality assurance system as partially satisfactory due to: (i) the lack of an institutional policy in this area; (ii) the informality of quality assurance processes and practices among the Institute's staff and (iii) the lack of a fully transparent governance structure, such as the lack of a clear division of roles and responsibilities in a number of areas among the Institute staff. In less than a year, the Institute made a remarkable effort to address the NVAO recommendations[31] for improvement and, upon a further review conducted by the independent NVAO Committee in 2015, the UNESCO-IHE education quality assurance system ended up being assessed as satisfactory during a second NVAO review (NVAO, 2015).

63. The NVAO positive review followed the introduction of three quality assurance mechanisms within the scope of the Institute's day-to-day operations. First, the set-up on a new international quality management system, whereby an increasing number of teaching staff (including lecturers)

[29] Such descriptors provide for highly specialised knowledge as the basis for original thinking and/or research, critical awareness of knowledge issues in a field and at the interface between different fields; specialised problem-solving skills in order to develop new knowledge and procedures and to integrate knowledge from different fields; and competencies to apply knowledge to address unpredictable problems, and for taking responsibility for contributing to professional knowledge (QANU, 2013, p. 16).

[30] The acquisition of knowledge and skills for successful graduates on completion of the MSc. are specified for each programme. For all programmes, these qualifications address: a) knowledge and theory; b) methods and techniques; c) analysis, synthesis and integration; d) research; and e) general academic skills including attitude to learning. These latter competencies include skills in critical thinking as well numeracy, literacy and communications compatible with a master's degree. Based on the level 7 descriptors, detailed learning outcomes are formulated for each specialization within the MSc. programmes.

[31] The NVAO accreditation of the MSc. programmes is valid until 31 December 2019 while the validity of the Institutional Audit holds until 7 April 2020.

(Table 12) needed to undergo a University Teacher Qualification (UTQ)[32] (UNESCO-IHE 2013, Utrecht University, 2013). (Box 4). Second, a more regular follow-up of the requirements included in the 'Institutional Code of conduct towards international students in Dutch higher education', to which the UNESCO-IHE was signatory (e.g., to ensure the provision of minimum quality level of services to international students and simplifying and shortening immigration procedures for students) (UNESCO-IHE 2013b, p. 9). Third, the frequent number of critical self-reflections, student satisfaction surveys and formative assessments, which the programme underwent on a regular basis

Table 12. Teaching Staff meeting UTQ requirements (in percentage)

	2011	2012	2013	2014	2015
Teaching staff quality (% UTQ)	13.5	20.2	26.1	25	-

Source: Adapted from *UNESCO-IHE Annual Reports (2010-2014)*

Box 4. UNESCO-IHE University Teach Qualification

In line with the Institute's strategy to enhance the quality of its education offering and in response to the findings of prior assessments suggesting the quality improvement of teachers' and lecturers' class delivery across departments, UNESCO-IHE joined the Mutual Agreement of University Teaching Qualification of all Dutch research universities (BKO in Dutch) in 2013. As a result, the compliance with teaching performance standards became more systematic for all teaching staff and more comprehensive personnel policies were developed. All teachers interested in receiving this qualification needed to submit a portfolio including examples from prior work (lecture materials, reflection reports) fulfilling the new quality standards adopted by the Institute. UNESCO-IHE also created a special 20-hour long qualification programme for its lecturers. Each eligible lecturer was requested to invest at least 100 hours in the whole qualification process. This would include the participation in meetings with external examiners and the development of a portfolio assessed by an independent examination committee with a grate from 1 to 5.

Source: *UNESCO-IHE, 2013; Utrecht University, 2013*

64. The increase in education quality was also made possible by two Institute's structural changes. First, the establishment of an Education Bureau in January 2011 whose overall responsibility was to coordinate the education resources available within the Institute's staff and the supply of training courses[33]. Second, the introduction of a new professional figure among the Institute's staff (a quality manager), whose main task was to embed the administrative and academic procedures into a quality management system.

Students' perceptions of UNESCO-IHE's education quality

65. Student evaluations general attested to a general satisfaction with the quality of the Institute's education programme. In addition, the information yielded by such evaluations was adequately used to inform any decision or strategy aimed at improving the quality of the Institute's programmes.

66. Overall, 87% of the MSc. students in the 2013-15 cohort found that the master programme modules were well coordinated and organized (a 10% increase if compared with the 2009-11 cohort). When asked whether they would recommend UNESCO-IHE to others, almost half of MSc. students (47%) in the 2013-2015 cohort responded that they certainly would do so and 45% stated that they probably would. In assessing the overall quality of the programme, a third of them (34%) responded that the UNESCO-IHE programme was excellent (an 80% increase compared with the 2009-2011 cohort evaluation), 47% stated that the programme was good and 18% of them regarded the programme quality as satisfactory (Table 13) (UNESCO, 2015).

[32] The decision to introduce this new mechanism was a direct response to one of the recommendations put forward in the 2013 NVAO accreditation report.

[33] Education Bureau's additional tasks included: the development of the UNESCO-IHE Education Policy, the monitoring of policy compliance on behalf of the Rectorate, the implementation of the quality assurance system, the overall organization and administration of the educational curriculum, the provision of administrative support towards the administration of the Ph.D. programmes, the supervision of the library facilities.

Table 13. Education Quality at UNESCO-IHE: A few indicators

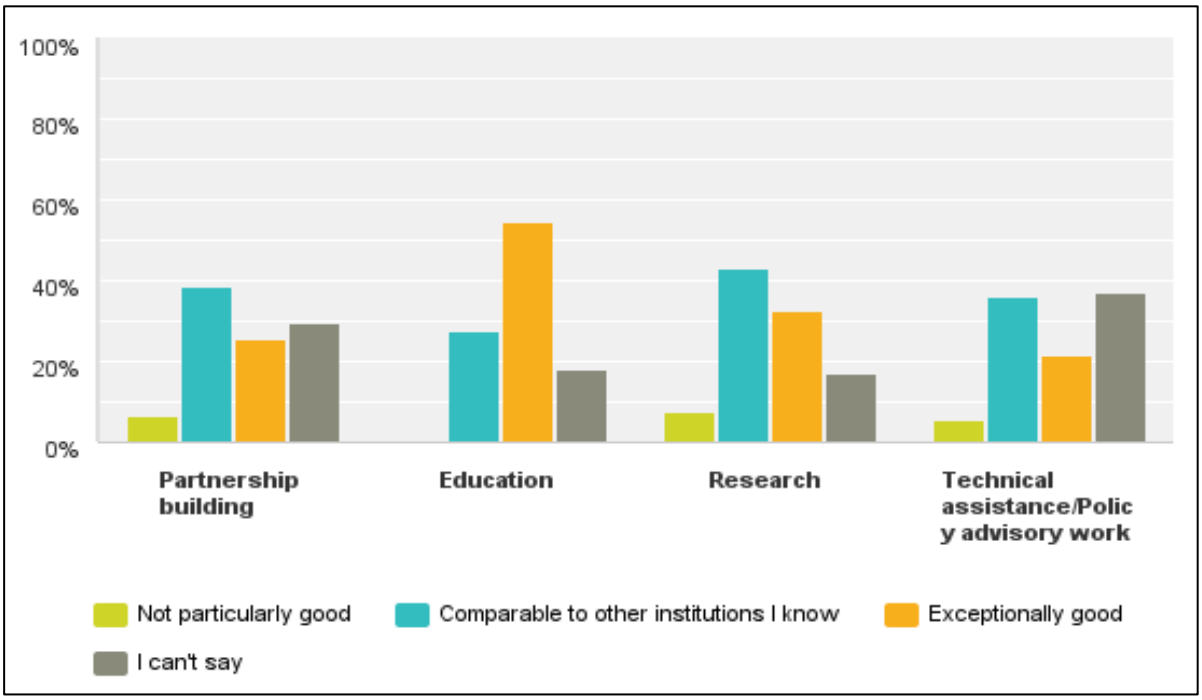
Year Quality of Education criteria	2011	2012	2013	2014	2015
MSc. student success rate (%)	89	94	93	92	90
Student satisfaction (1-5 scale)	3.91	3.95	3.83	4.09	4.13

Source: Adapted from *UNESCO-IHE Annual Reports (2010-2014)*

UNESCO-Water Family members' perceptions of UNESCO-IHE's education quality

67. When asked how UNESCO-IHE compares to other water-related academic institutions in the world, 54% (n=51) of the Water Institutes, IHP National Committee and Water Chairs responding to the survey stated that UNESCO-IHE education programme was exceptionally good, more than its research (considered exceptionally good by 32% of the respondents) or technical assistance Policy Advisory Work (considered exceptionally good by 22% of the respondents) (Figure 4).

Figure 4. UNESCO Water Family Members' Perception of UNESCO-IHE work quality compared to that of other institutions



Source: *IOS, 2015*

68. According to the independent NVAO committee who led the accreditation review of UNESCO-IHE in 2013 and 2015, an average 85% of the Institute's alumni were still contributing to their respective countries' development processes upon the completion of their studies in Delft: the majority students keep working in the water sector and a good number of them (e.g., 58% of those who had graduated from the MSc. in Water Management) were involved in reform processes (Table 14).

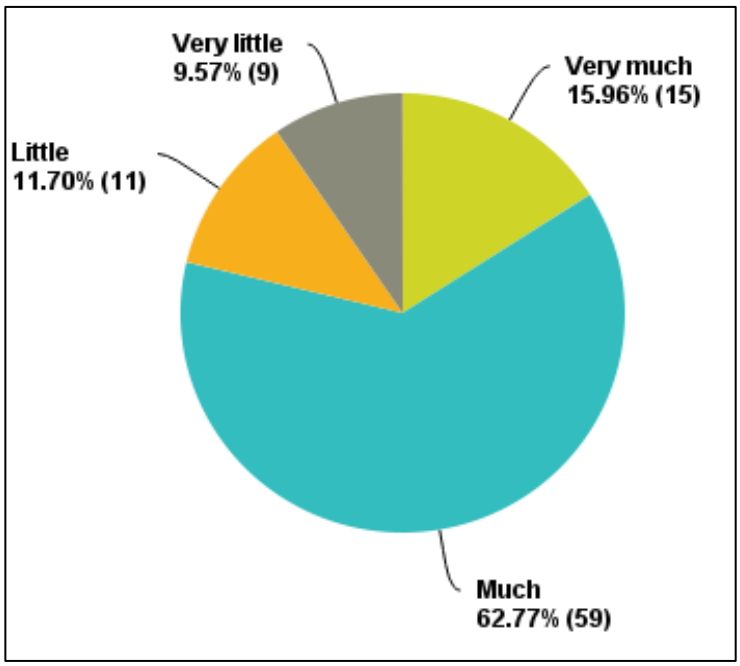
Table 14. NVAO Assessment of UNESCO-IHE's social impact

NVAO Assessment by Master programme (2013)*	Assessment and Achieved learning outcomes	Societal Impact
MSc. in Water Management	Satisfactory	Eighty-one percent of alumni contribute to the development of their region/country and 58% are involved in reform processes.
MSc. in Water Science and Engineering	Satisfactory	Ninety percent of alumni still contribute to the development of their region/country and 91% state that they are currently employing in their day-to-day work the skills and competencies acquired at UNESCO-IHE.
MSc. in Municipal Water and Infrastructure	Satisfactory	The cooperation with partners in the global South distinguishes this programme from other programmes on Municipal Water and Infrastructure.
MSc. in Environmental Science	Satisfactory	The UNESCO-IHE programme has a specific mandate to train mid-career water professionals from all over the world, including from emerging and least developed countries. UNESCO-IHE therefore takes into account and assesses the work experience of applicants in the admission procedure.

Source: *NVAO, 2013; NVAO, 2015*

69. The impact produced by the Institute's educational offering was also attested by the majority of the IHP national committees, Water Institutes and Chairs responding to the survey. When asked to what extent UNESCO-IHE's work is influencing education on water-related issues at the global level, 63% of respondents (*n*=59) stated that it was influencing much and 16% (*n*=15) that it was influencing very much (Figure 5).

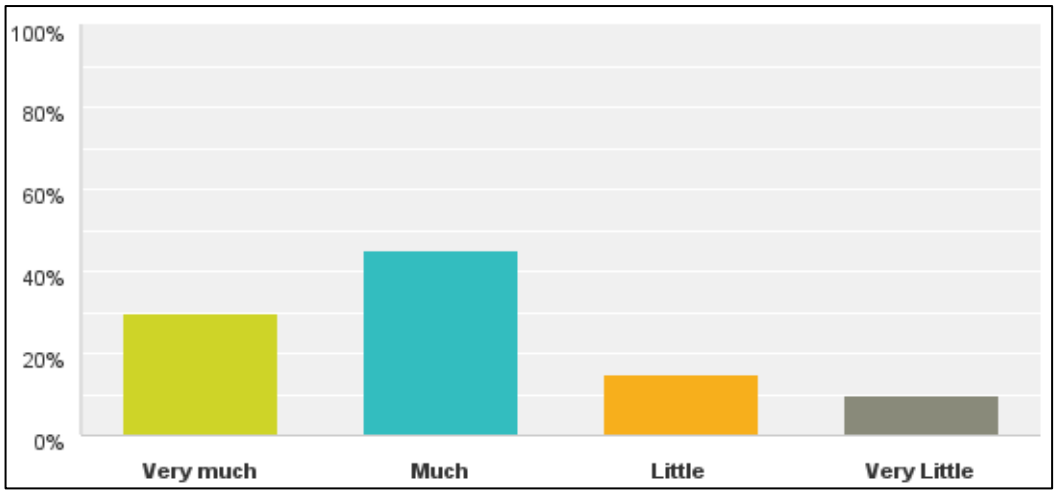
Figure 5. UNESCO Water Family Members' Perception of UNESCO-IHE's impact on water-related education at the global level



Source: IOS, 2015

70. International scholars, too, confirmed the impact of UNESCO-IHE educational offering on water-related education at the global level. Seventy-five percent of respondents (*n*=15) stated that UNESCO-IHE was influencing either much or very much (Figure 6).

Figure 6. International Water Scholars' Perception of UNESCO-IHE's impact on water-related education at the global level

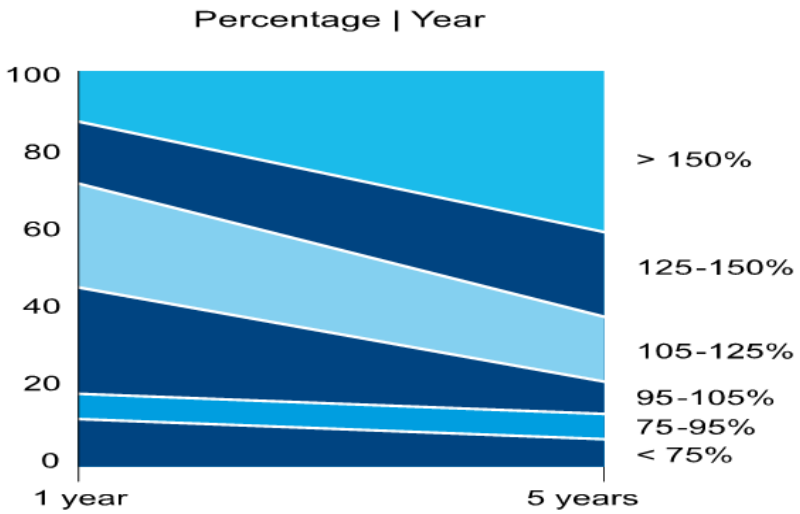


71. Furthermore, according to the 2011 Alumni Tracer Study, the majority of respondents (*n*=1,200) indicated that their studies at UNESCO-IHE had allowed them to have an impact on the development of their own country/region (the average score was 3.89 out of 5 where 5 stood for "very high impact"). That was especially true for the respondents from Africa and Asia.

72. The respondents' self-perception of the UNESCO-IHE educational programmes' positive impact seemed to be confirmed by two additional findings emerged during the desk review as well in the course of the interviews with a number of current students and alumni held in the course of the evaluation:

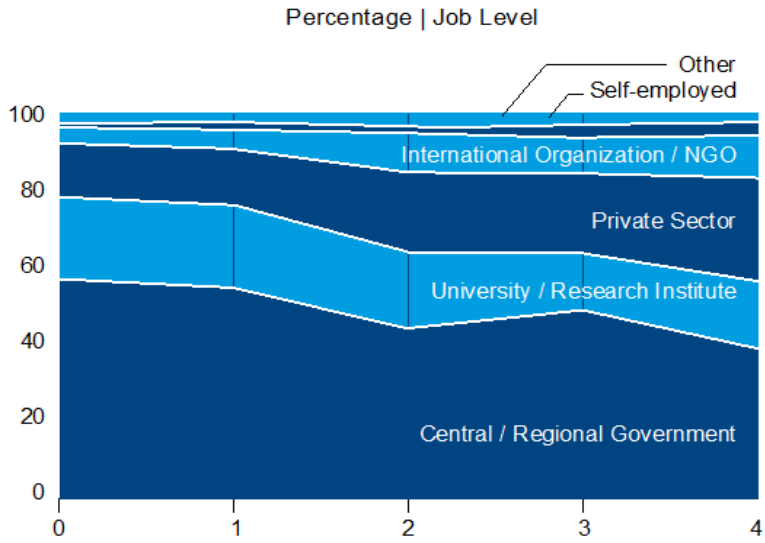
- the above-than-average remuneration reserved to alumni upon completion of the UNESCO-IHE in light of their newly acquired skills and competencies (according to 47% of respondents, their salary increased by 105-150% one year after graduation and, according to 31% of alumni, the salary increased by over 150% five years after graduation (Alumni tracer study, 2011) (Figure 7); and
- the relatively high professional status gained by alumni upon their return home (over 50% of the respondents attained managerial or executive levels by their 4th job) (Figure 8).

Figure 7. Salary increase after UNESCO-IHE graduation



Source: UNESCO-IHE 2011

Figure 8. Job sector of occupation after 4th job since UNESCO-IHE graduation



Source: UNESCO-IHE, 2011

2.6.5 Enabling Factors of Education Achievements

73. **The constant focus on developing countries:** as attested by alumni survey and the students' evaluations and alumni survey conducted between 2010 and 2015, UNESCO-IHE's academic programmes delivered during this period focused on themes and topics that were relevant to both developing and transition countries. Likewise, the fact that over 85% of the Institute applicants came from developing countries and countries in transition and that the percentage of female students had increased to nearly 40% attested to the correct targeting of the educational programme (Box 5).

Box 5. The UNESCO-IHE Focus on developing countries: A sample of initiatives

- *WaterNet Southern Africa.* WaterNet is a regional network of university departments and research and training institutes specializing in water. The network helped strengthen regional institutional and human capacity in Integrated Water Resources Management (IWRM) through training, education, research and outreach by harnessing the complementary strengths of member institutions in the region and elsewhere.
- *Natural systems for wastewater treatment and re-use.* Natural treatment systems like constructed wetlands are very attractive and directly applicable in developing countries, even under different climatic conditions. Research by the NATSYS projects showed that these systems are a low cost, efficient and effective technology for wastewater treatment and reuse applications.
- *Vision of Green economy in Myanmar*: Water is high on the political agenda in Myanmar. A water policy was recently approved by the National Water Resources Committee (NWRC). The country is rich in water resources, but also faces many water-related issues, combined with limited institutional coordination and support. The new water policy offered a daring perspective on Myanmar's future and UNESCO-IHE alumni play a central role in these new developments.

Source: *UNESCO-IHE, 2013b*

74. **UNESCO-IHE targeting:** UNESCO-IHE academic programmes mainly catered to students as well as mid-career professionals from developing countries and countries in transition.

75. **Student body diversity:** the truly diverse background of the UNESCO-IHE student body (on average, students enrolled each year represent over 40 countries) and the exceptionally intercultural environment, which its student gets exposed to, enriched the quality of class discussions and students group work.

76. **The institutional prestige:** the UNESCO-IHE association with the UN and the alignment with the international principles of sustainable water management attracted some of the world's best teachers and lecturers in the water field.

77. **The continued quest for balance between theory and practice:** teachers and lectures made a specific and continued effort to combine in-class learning with policy-oriented research and hands-on field experience to such an extent that it was often difficult to separate education from research and capacity development.

78. **The balance struck by the Institute's teaching staff between the interdisciplinarity of the programme and the Institute's specific programmatic focus on water:** UNESCO-IHE was able to combine the interdisciplinarity of the Institute's training curriculum (which aimed to provide their students with the so-called T-shape competency profile)[34] with a systematic focus on water and a selected number of related themes, namely, water supply and sanitation, water related hazards and climate change, water and ecosystems quality, water and food security, water governance and management, and information and knowledge systems. As of 2010, the Institute staff started devoting an increasing amount of time and energy to the teaching of emerging themes, such as water conflict management, global change and adaptation.

79. **The increasing availability of self-designed specialization tracks:** unlike the past when students enrolled in the Programme could only follow courses as part of pre-arranged concentrations and/or specialization, students admitted into the programme as of 2013 had more flexibility not only to elect the courses they wished to take but also to structure their sequence and combination as part of their personal development plans. This translated into an increase in the number of students (including from developing countries) signing up for the three-week modular courses and, as a result, into greater profits for the Institute.

80. **A strong Alumni Network:** The bond existing between the Institute and its former students (40% come from Africa, 30% from Asia, 15% from Latin America, 10% from the Arab region) continued beyond their completion of the programme. Between 2010 and 2015, the Institute's Alumni Officer kept in touch with alumni (including regional alumni associations) through online bulletins, a variety of social media (e.g. Facebook, and twitter) platforms, and a periodic alumni e-newsletter. Alumni received an attractive 30% discount to attend refresher and follow-up courses, some of which were organized in their own regions. As part of its alumni engagement strategy, UNESCO-IHE also organizes an annual Alumni Day (held in October in parallel to the opening of the academic year) and various events catering to alumni, often in the same region, often with a professional networking finality. As of 2013, a UNESCO-IHE award started being assigned annually to a particularly outstanding alumnus/a whose work in the water sector has proved to improve people's quality of life (a total of 50 applications were received as of March 2016).

81. **The free access to library resources as a result of the Institute's affiliation with UNESCO and the International Institute of Social Sciences in The Hague:** despite the partnership agreements signed with a number of academic institutions in the Netherlands, UNESCO-IHE students could not access their respective virtual libraries through remote authentication via a portal type connection. However, the direct access to UNESCO library in Paris allowed the Institute staff and students to gain free of charge access to fundamental water-related online resources (e.g., in the social sciences).

82. **UNESCO-IHE wide use of modern technologies:** UNESCO-IHE developed an increasing number of online courses since 2010 and, in order to make it possible, made ample use of modern technologies. The Information & Technology (IT) Department established in 2010 developed a strategic plan, which envisaged the launch of a platform that would allow an easier sharing and

[34] The vertical bar of the letter T represents the in-depth knowledge of the main discipline and the horizontal bar reflects the basic knowledge of adjacent disciplines. For instance, the master programme in Water Science and Engineering combines cognitive competencies in a certain specialization (e.g. hydrology; vertical leg of the T) and other cognitive/knowledge competencies in neighbouring fields (e.g. hydraulics, aquatic ecology, land use management etc.) with more functional, personal and values competencies and meta-competencies (horizontal bar of the T).

dissemination of educational materials among staff and students alike. As part of this new strategy, every student entering the programme received a laptop and all computer labs and classrooms underwent technical upgrades. The renewal plan included the introduction of the following changes: the creation of a hydro-informatics lab, the set-up of a central modelling and computation support group which would develop many of the mathematical modelling tools used by the Institute's staff and students; and the construction of a water lab covering a surface of over 1500 m^2.

83. **UNESCO-IHE Teachers and lecturers' innovative didactic approaches:** as attested by the students' academic evaluations, the combination of communicative and task-based approaches (only 31% of students in 2011 were familiar with this approach before entering the programme) adopted by teachers and lecturers in class were much appreciated by students, as opposed to the traditional lecture-style approach which 55% of students were used to and regarded as ineffective.

2.6.6. Challenges

84. **Limited capacity to meet increasing demand:** as a result of what was normally termed by some UNESCO-IHE staff as the '8/10 syndrome', eight out of ten qualified candidates[35] had to be rejected on average in 2012-2015, due to the limitations in the Institute's resources.

85. **The tensions between the comprehensiveness of the programme and the students' need to specialize in a specific water-related niche:** while the interdisciplinarity of the modules forming the MSc. academic programme offered by UNESCO-IHE was often identified as of its key strengths, the compact nature of the programme and the variety of courses attended by students did not always allow them to deepen their understanding and analysis of specific issues falling under a specialized water-related topic. According to the 2011 and 2015 students' evaluation as well as the conclusion of the NVAO accreditation committee (NVAO*a*, 2013, p. 3), this was aggravated by the intense workload and additional pressure which UNESCO-IHE students were subject to, especially if compared to their counterparts in other similar programmes (e.g., the UNESCO-IHE 18-month programme tends to be 6 months shorter than most other equivalent programmes).

86. **Risk of perpetuating the technological divide:** UNESCO-IHE made a continued effort to ensure the applicability of module content and adopted technologies to the needs and interests of students coming from developing countries and countries in transition. However, that was not always effective. According to some student evaluations, for instance, water management courses were often structured as traditional urban water management courses (focused on treatment and eutrophication) and the programme did not always devote the necessary attention to either distribution processes and practices or forestry and agriculture.

87. **Insufficient degree of accessibility of Institute's training materials:** despite the development of the MOODLE platform and the use of modern technologies as part of the online course offerings, the materials posted on the web were not always easily accessible by partner institutions. Likewise, the non-dissemination of training curricula (e.g., via Open Access) prevented local training institutions in developing countries and countries in transition from improving their own programs, as it was expected based on UNESCO-IHE original mission.

88. **The gender gap within academic staff:** similar to other training institutions, the percentage of academic females within the Institute (20% of the total number of academic staff) was still quite low, especially at the professorial level (full-tenured professors and associate professors) (Table 15). To the contrary, the percentage of female students over the total student body improved over the years, thanks also to some new Dutch funding conditions (from 10-15% in 2003 to 40% in 2015[36]).

[35] During the analysis, it was observed that a number of qualified and accepted students had lower-than-expected English proficiency, which could be explored further to sharpen entry requirements in the future.
[36] The gender gap is a bit higher in the Ph.D. programme (35% of students are female) than in the MSc programme (38% of students are female).

Table 15. Gender Gap in UNESCO-IHE Staff

	Male	Female	% Academic females
Lecturers	15	8	35%
Senior Lecturer	18	8	31%
Associate Professor	19	4	17%
Professor	14	4	22%
Total	66	24	27%

Source: Adapted from *UNESCO-IHE Annual Report, 2013.*

2.7. Research

Key Message

UNESCO-IHE's research work proves to be exceptional especially in light of the fact that it addresses several issues relevant to the complex water issues in developing countries. Its innovation-focus, its close link with capacity development as well as the institute's privileged access to national government's sources and programmes on which to conduct research, make it quite unique.

2.7.1. Key Achievements (Outputs)

89. The body of water-related literature produced globally has been growing at a steady race over the last decade (e.g., 9.2% per year between 2007 and 2011) with a total number of over 6,000 published articles in 2011, not only in the engineering field but also within the realm of social sciences and mathematics.

90. Consistent with the most recent international publication figures and in response to the increased funding for research on the nexus existing between water and food, energy and climate (Endo, Tsuriita, Burnett & Orencio, 2015), research became an increasing area of interest for UNESCO-IHE as of 2010 and this trend appears likely to continue in the following years.

91. A comparison of UNESCO-IHE research with that conducted by other 6 Dutch academic institutions (Table 16) confirmed the progress made by UNESCO-IHE research over the years: between 2007 and 2012, UNESCO-IHE was the second most prolific of the seven universities included in the study and its number of citations was the third highest in the group.

Table 16. Bibliometric indicators for SENSE institutes[37] for the period 2007-2012 *

Chair group	N	C	CPP	RI
CML	232	3402	14.7	2.16
Copernicus	610	11949	19.6	3.22
IHE	776	8053	10.4	1.38
ITC	790	8049	10.2	1.72
IVM	604	8297	13.8	2.50
WMG	89	1464	16.5	2.91
WIMEK	1614	27855	17.3	2.44

Source: *Gerritsma, Fest & van der Togt, 2014*

[37] CML = Institute of Environmental Sciences (Leiden University), Copernicus = Copernicus Institute of Sustainable Development (Utrecht University), IHE = UNESCO-IHE (10 chair group); ITC = the Faculty of Geo-Information Science and Earth Observation (University of Twente), IVM = Institute of Environmental Sciences (VU University), WMG = chair group Water Management (part of the Department Water Engineering & Management, University of Twente), WIMEK = Wageningen Institute for Environment and Climate Research.

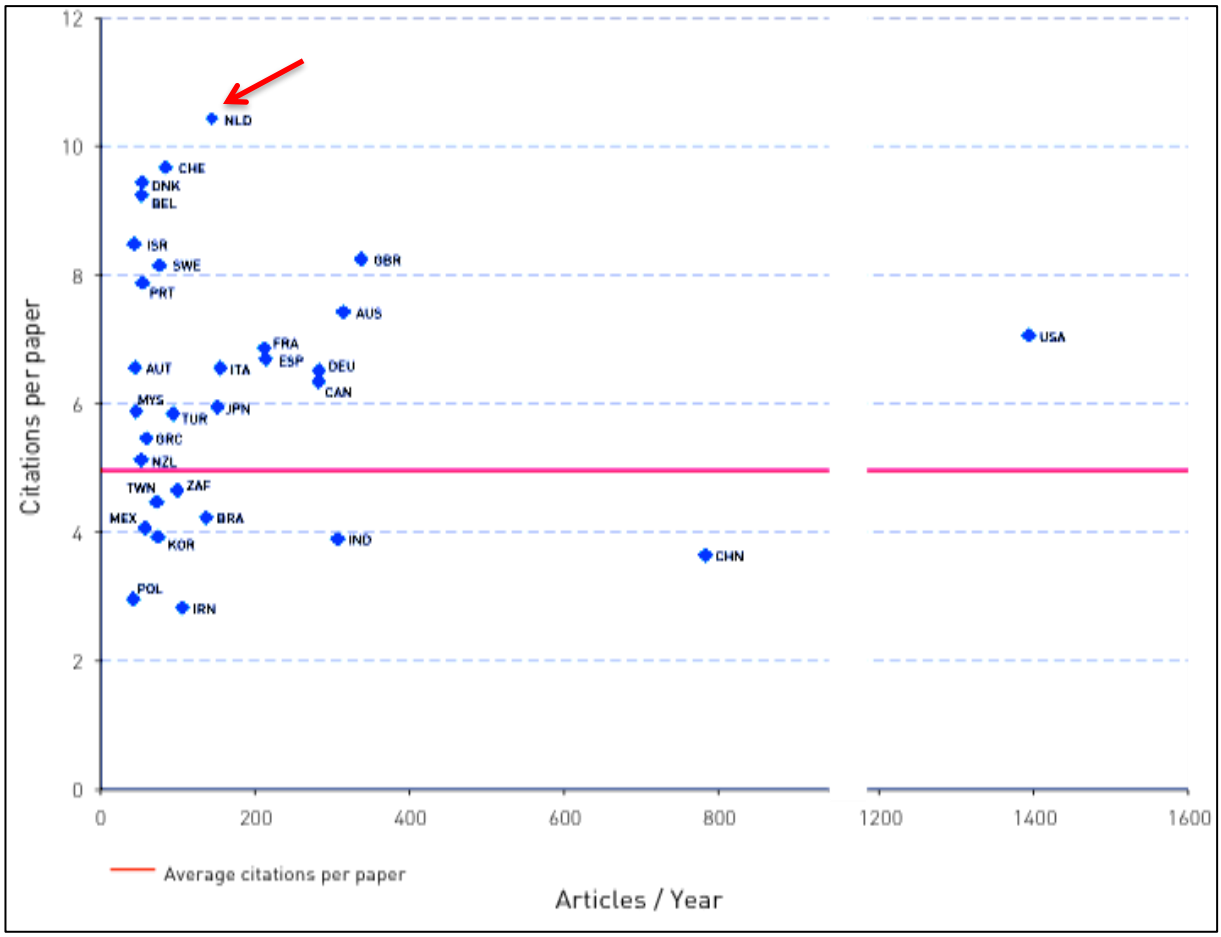
*Where N is the number of peer reviewed publications; C the number of citations to these publications; CPP the Average citations per publications; RI the relative impact.

92. In developing its research agenda, UNESCO-IHE faced strong international competition: as of 2012, the US (1,400 articles per year) and China (800 articles per year) represented the two largest sources of water-related publications.

93. Although the number of international research collaborations (whereby an article was co-authored by researchers of 3-4 different countries) grew over time, the outputs were largely lagging behind similar institutions in the US and China. That notwithstanding, water-related research publications in some of the countries with which UNESCO-IHE had established some research partnerships (e.g., Malaysia and Iran) experienced an exponential increase in number of research articles produced, along with some other countries (e.g., the Netherlands, Switzerland and the UK) that had traditionally invested in scientific research (Figure 9).

94. UNESCO-IHE always promoted research as an integral part of its educational programmes (research represented one of the pillars of the Institute's Vision on Quality of Education). In 2010-2015, research at the Institute focused on the following six areas: 1) Safe drinking water & sanitation; 2) Water-related hazards and climate change; 3) Water and ecosystems quality; 4) Water management & Governance; 5) Water, food and energy security; and 6) Information and knowledge systems (for a more detailed list of the Institute's lines of research, see Annex 6).

Figure 9. Average Number of citations per water-related publication per country (2007-2011)



Source: *SIWI, 2012*

95. Each student enrolled at UNESCO-IHE in 2010-2015 was strongly encouraged to pursue independent academic research, as attested by the annual average of 242 peer-reviewed journal articles (76% of which were authored with partners from developing countries), 28 book chapters, 148 conference papers and 15,000 citations (Table 17). The total number of UNESCO-IHE

publications almost doubled in 2013 (if compared with the 2008 figures) as a result of the Institute joining the Research School for Socio-Economic and Natural Sciences of the Environment (SENSE)[38]. Such increase in the number of publications was also correlated with the increase in the number of qualified Ph.D. fellows conducting research at the Institute (from 90 in 2009 to 130 in 2012)[39]: all Ph.D. level students were required to publish four articles before the defence of their final thesis).

Table 17. UNESCO-IHE Research: Key Indicators

Publication outputs (No.)	**2011**	**2012**	**2013**	**2014**	**2015**
- Peer-reviewed journal articles	187	268	254	260	248
- Journal articles with partners from d/t countries (%)	73	73	80.5	76.4	56
- Books	6	13	0	5	4
- Book chapters	25	40	26	23	29
- Conference papers	150	143	197	102	50
- Scientific presentations (No.)	183	183	317	201	-
- Outreach presentations (No.)	34	34	42	65	-
- H-index of the Institute	58	58	59	69	9
- Citation count	13,066	13,246	13,623	19,904	-

Source: Adapted from UNESCO-IHE Annual Report 2014.

96. UNESCO-IHE research *productivity* was rated 'very good' by an independent research quality assessment (SENSE, 2014) (Table 18). The assessment confirmed the upward trend in research productivity: five years earlier, the same assessment stated that research productivity was merely good. All UNESCO-IHE departments increased their productivity between 2009 and 2014 with the following three experiencing the highest increment: Research Land and Water Development; the Pollution Prevention and Resource Recovery; and the Hydraulic Engineering and River Basin Development (Table 18).

Table 18. SENSE Assessment of research PRODUCTIVITY by departments (2009-2014)

UNESCO-IHE Departments	**Productivity**	
	2009	**2014**
Aquatic Ecosystems	2	3
Coastal Science & Engineering and Port Development Group	3	4
Hydro-informatics Group	3	4
Hydrology and Water Resources	3	4
Land and Water Development	1.5	3
Pollution Prevention and Resource Recovery	2.5	4
Hydraulic Engineering and River Basin Development	2.5	4
Sanitary Engineering	-	4
Water Management	3	4
Water Supply Engineering	4	4
Average Score	**2.7**	**3.8**

*Legend: 5 = excellent, 4 = very good, 3 = good, 2 = satisfactory, 1 = unsatisfactory.

[38] SENSE is accredited by the Royal Netherlands Academy of Sciences (KNAW), and aims to bring together excellent academic research groups from nine universities and research centres across the country.
[39] UNESCO-IHE Annual Reports 2009 and 2012.

Source: Adapted from *SENSE 2009, 2014*

97. In 2010-2015, research at the Institute focused on the following six areas: 1) Safe drinking water & sanitation; 2) Water-related hazards and climate change; 3) Water and ecosystems quality; 4) Water management & Governance; 5) Water, food and energy security; and 6) Information and knowledge systems (for a more detailed list of the Institute's lines of research, see Annex 5)

Research quality

98. UNESCO-IHE research *quality* was rated "very good" by an independent assessment conducted in 2014 (SENSE, 2014). That marked an improvement compared to the results of a similar assessment conducted in 2009 (SENSE, 2009), when the quality of UNESCO-IHE's research was satisfactory but not good yet (Table 19).

Table 19. SENSE assessment of research QUALITY by departments (2009-2014)

UNESCO-IHE Department	Quality	
	2009	2014
Aquatic Ecosystems	3.5	3
Coastal Science & Engineering and Port Development Group	3.5	4
Hydro-informatics Group	3.5	3.5
Hydrology and Water Resources	3.5	4
Land and Water Development	2	3
Pollution Prevention and Resource Recovery	2.5	4
Hydraulic Engineering and River Basin Development	3	3.5
Sanitary Engineering	-	3
Water Management	3	4.5
Water Supply Engineering	4	3.5

Source: Adapted from *SENSE 2009, 2014*

*Legend: 5 = excellent, 4 = very good, 3 = good, 2 = satisfactory, 1 = unsatisfactory.

99. The 16% increase in the average note assigned by SENSE[40] to the UNESCO-IHE's scientific quality (from 3.1 in 2009 to 3.6 in 2014) was mostly explained by the Institute's impressive spike in research output, especially after 2012. The increased quality of research at the Institute was made possible by the staff stricter compliance with research quality criteria: between 2011 and 2014, the number of Institute staff qualified to be part of SENSE Research School almost tripled (from 17 to 48) (Table 20).

Table 20. UNESCO-IHE Research: Other key quality indicators

	2011	2012	2013	2014	2015
Staff meet SENSE (SEP) criteria (No.)	17	23	39	48	-
Academic staff with PhD (%)	79	81	89	81	-

Source: Adapted from UNESCO-IHE, 2014

100. The increase in research quality was also made possible by the rise in the number of research staff directly involved in research activities (Table 21). The fact that all Departments started investing more in research generally led to an increase in scientific quality and social relevance.

[40] A review committee visited the Institute in 2014 and a self-evaluation was conducted at the institutional and Chair groups levels for the period 2007-2013 as part of this exercise.

Table 21. UNESCO-IHE capacity invested in research by department (2009-2014)

UNESCO-IHE Department	Tenured Staff (in FTE)		Total Staff (in FTE)	
	2009	2014	2009	2014
Aquatic Ecosystems	-	2.1	-	8.8
Coastal Science & Engineering and Port Development Group	-	0.8	-	11.5
Hydro-informatics Group	2.6	3.5	-	12.5
Hydrology and Water Resources	1.7	3.5	-	9.8
Land and Water Development	1.2	1.0	-	10.7
Pollution Prevention and Resource Recovery	2.0	1.7	-	27
Hydraulic Engineering and River Basin Development	-	1.6	-	15.9
Sanitary Engineering	-	2.8	-	12.9
Water Management	1.8	4.2	-	13.6
Water Supply Engineering	5	3.2	-	11.5
Average Score	**2.3**	**2.4**	**-**	**13.4**

Source: Adapted from *SENSE 2009, 2014*

101. Furthermore, the quality of UNESCO-IHE's research was enhanced by a more efficient use of staff time invested in research supervision. Each student was systematically assigned a mentor whose main task was to supervise the research progress and ensure the technical quality of its content (the average supervision input was 88 hours per graduate as opposed to the average coordination input equivalent to 251 hours per module) (Table 22).

Table 22. UNESCO-IHE Staff time involvement in teaching and research supervision

Year Efficiency	2011	2012	2013		2014	2015
MSc. thesis supervision input (hours/graduate)	93	94	87		80	
Teaching management/coordination input (hours/module)	257	248	251		249	

Source: Adapted from UNESCO-IHE, 2014b

102. The strong research orientation pursued by the UNESCO-IHE both at the MSc. and Ph.D. programme level was particularly important as it refined all students' research and analytical skills and allowed them to contribute original ideas to the development of the water management field, especially in developing countries where the academic work published in this area still continues to be quite limited. That every MSc. student published on average three articles (both in and outside of peer-reviewed journals) by the time they had completed their academic programme at UNESCO-IHE was particularly impressive, especially if one takes into account that the majority of students coming from developing countries had no track record of publications before their admission into the programme.

2.7.2. Key Achievements (Outcomes)

103. The production and dissemination of quality water research by UNESCO-IHE staff and students contributed to the Institute's mission to create and disseminate a global water-related knowledge base, as mentioned in its Founding Document.

104. According to a systematic review conducted by UNESCO-IHE in SCOPUS (the largest database of peer-reviewed articles in the science sector), UNESCO-IHE was the sixteenth most prolific academic institution in the world in the water science sector, with its average of 15.4 articles per year, and an average of 4.3 citations for each article (UNESCO-IHE, 2014). The same review

assigned a higher ranking to two other Dutch Universities (Delft University of Technology ranked 7th and Wageningen University ranked 12th). It is worth mentioning that a similar study conducted by Elsevier had not included UNESCO-IHE at all (see last column in the table below (Table 23).

Table 23. The world's most prolific and impactful water research institutions

Institution Name	Av. articles per year	Cites per article	UNESCO-IHE Rank	Elsevier Rank
Eidgenössische Technische Hochschule Zürich	8.4	8.6	1	5
University of Washington	16.2	8.3	2	1
University of California, Davis	14.6	7.2	3	11
Arizona State University	16.6	7	4	2
US Environmental Protection Agency	1.6	6.6	5	18
University of California, Berkeley	9.8	6.5	6	3
Delft University of Technology	14.8	5.9	7	4
University of Arizona	30.4	5.9	7	13
CSIRO Land and Water	22.6	5.9	7	14
Texas A & M University	15.2	5.9	7	17
University of Waterloo	10.2	5.4	11	20
Wageningen University	14.2	5.3	12	7
University of Florida	17.8	5	13	15
Oregon State University	9.4	4.7	14	10
US Geological Survey	3	4.4	15	16
UNESCO-IHE	**15.4**	**4.3**	**16**	**Not Listed**
Centre National de la Recherche Scientifique (CNRS)	29.2	4.2	17	8
University of Wisconsin-Madison	7	4.2	18	6
Colorado State University	10.4	4.1	19	12
University of British Columbia	12.2	3.7	20	19
USDA Agricultural Research Service	5	2.8	21	9

Source: *Adapted from UNESCO-IHE 2013b.*

105. Such positive findings were also confirmed by the conclusions of the 2014 SENSE assessment. The SENSE independent review committee defined the quality of UNESCO-IHE research as world class in light of three main factors:

- *The Institute's excellent academic reputation, especially in the domain of water management in developing countries:* the increase in UNESCO-IHE recognition and visibility increased between 2009 and 2014 was mainly justified by two main factors. Institutional recognition was enhanced by both the UN affiliation and the alumni's promotion of the Institute's educational and capacity development programmes in their respective countries. Visibility was ensured by the extensive involvement of UNESCO-IHE staff in educational partnerships, international conferences, research consortia and technical assistance missions to a vast number of countries every year. On top of that, the increased number of publications both in peer-reviewed and grey literature contributed to the dissemination of the Institute's work. Compared to those bibliometric analyses that had been conducted in 2009 and 2013 and which, among other things, had failed to take into

consideration that 45% of the UNESCO-IHE papers had been published in the top three open-access water journals, the 2014 UNESCO-IHE's research average impact index (1.5) was higher than ever before (Table 24);

- *The Institute's staff high capacity:* The growing number of winning proposals developed by UNESCO-IHE staff to receive funding from international competitive funding processes rested on the work of highly professional staff who, in turn, allowed the Institute to mitigate the effects of the funding cuts (e.g., the drop in Dutch government subsidies estimated to be equal to 1 million euro between 2013 and 2015.
- *Collaborative initiatives between different departments:* UNESCO-IHE departments often collaborated with each other on joint research efforts in an effort to come up with integrated and practical solutions to complex water issues in developing countries and countries in transition.

Table 24. UNESCO-IHE Societal impact and visibility by department (2009-2014)

UNESCO-IHE Department	Societal Impact		Visibility	
	2009	2014	2009	2014
Aquatic Ecosystems	3.5	3	3.5	3
Coastal Science & Engineering and Port Development Group	3	4	4	3.5
Hydro-informatics Group	3	3.5	4	4
Hydrology and Water Resources	3	4	4	4.5
Land and Water Development	2	3	2	3
Pollution Prevention and Resource Recovery	3	3.5	4.5	3.5
Hydraulic Engineering and River Basin Development	3	4	3.5	3.5
Sanitary Engineering	-	4	-	4
Water Management	4	4.5	4	4.5
Water Supply Engineering	4.5	4	3	4
Average Score	**3.2**	**3.7**	**3.6**	**3.7**

*Legend: 5 = excellent, 4 = very good, 3 = good, 2 = satisfactory, 1 = unsatisfactory.

Source: Adapted from *SENSE 2009, 2014*

106. According to the 2014 Sense assessment, the social impact produced by UNESCO-IHE research increased by 16% between 2009 and 2014. The research societal impact mainly manifested itself in ten different forms:

- The creation of a new cadre of researchers in developing countries through the provision of in-country research capacity building (the set-up of joint MSc. and Ph.D. with local academic institutions was instrumental in facilitating this impact) and the creation of "water sustainability communities of practice" (through local institutional capacity building, UNESCO-IHE contributed to the more sustainable and useful use of wetlands and a strategy was developed by UNESCO-IHE staff on how to enhance the influence of such professional committee on national and sub-national decision-making, also through the use of social media, such as Facebook and Twitter);
- The development of policy documents and guidelines aimed at enhancing water professionals' practices in development countries (e.g., UNESCO-IHE influenced the development of the FAO level guidelines; UNESCO-IHE provided relevant inputs to the development of international conventions, such as RAMSAR, that are applied by international organizations like WWF and Wetlands International);
- The sensitization of the international research community on water issues in developing countries through the publication of its staff and students research in high quality journals such as *Water Research*, and *Science*;

- The promotion of new platforms and channels for both the dissemination and exchange of water-related research in developing countries (UNESCO-IHE staff started journals for developing countries - *Journal of Water Sanitation and Hydrology for Developing Countries* - and contributed to a set of important IWA textbooks in the area of sanitary engineering; UNESCO-IHE used YouTube, blogs, and special programmes, to disseminate the findings of its research so as to raise awareness of pollution prevention and resource recovery issues among the general public);

- The establishment of research cooperation not only with other academic institutions but also with local water authorities and development organizations;

- The provision of direct policy advice and capacity development (e.g., specialized short-term courses) to national decision-makers: UNESCO-IHE was part of the research consortiums that gave advice to governments and international agencies on the world's largest estuaries, such as Yangtze and Mekong, on coastal protection and restoration are extremely relevant topics; UNESCO-IHE research on the development of strategies that institutions could use to assess and mitigate natural hazards);

- The creation of innovative technological solutions to concrete water problems experienced by communities, countries and regions in developing countries (fish pond based wastewater treatment technologies were developed in cooperation with UNESCO-IHE, giving net income to the sewage treatment plant; UNESCO-IHE dealt effectively with stakeholders such as the EU, financial institutions, and foundations that were interested in investing in sanitary projects for countries in need of new, low cost technologies; thanks to the innovative research and products developed by UNESCO-IHE, flooding events could be predicted and sources of fecal contamination could be removed via improved waste treatment methods);

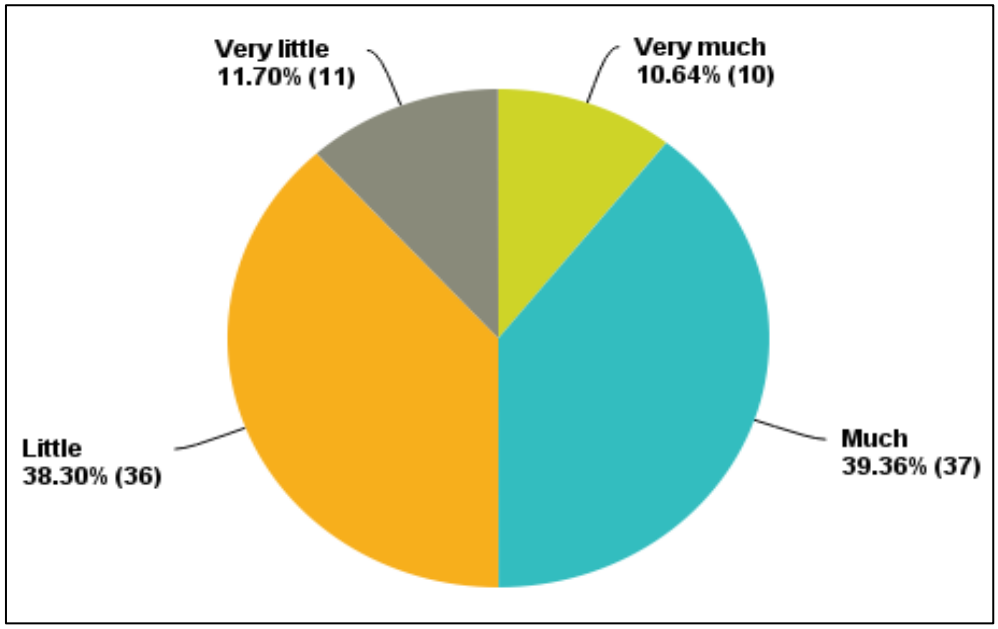
- The creation of partnerships with the private sector (the implementation of technological advancements was achieved via a strong network with the Dutch drinking water industry and related industries - technology suppliers - but was always geared towards the real stakeholders such as water utilities, refugee camps and universities in the developing world; UNESCO-IHE's contributions to the development of full-scale drinking water installations for iron, arsenic and chromium removal had considerable, measurable impact in various countries);

- The development of computer technologies and models that helped water specialists to better theorize and understand contemporary water issues, especially in Africa and Asia (UNESCO-IHE research contributed to the development of the DFlow-FM Code; likewise, an article on an open-source storm impact model XBeach ranked top 1 most cited publication since 2008 in the Coastal Engineering Journal);

- The staff participation in scientific organisation and community service projects (UNESCO-IHE research staff served *pro bono* in many Editorial Boards and scientific committees and a large number of them, in recognition of their contribution, received internationally renowned scientific awards).

107. The perception of the societal impact produced by the Institute's research, although not as strong as that produced by its educational programmes, was confirmed by 51% of the IHP national committees, Water Institutes and Chairs responding to the survey. When asked to what extent UNESCO-IHE's research was influencing the way water-related issues are being addressed at the global level, 40% of respondents (*n*=37) stated that it was influencing much and 11% (n=10) that it was influencing very much (Figure 10).

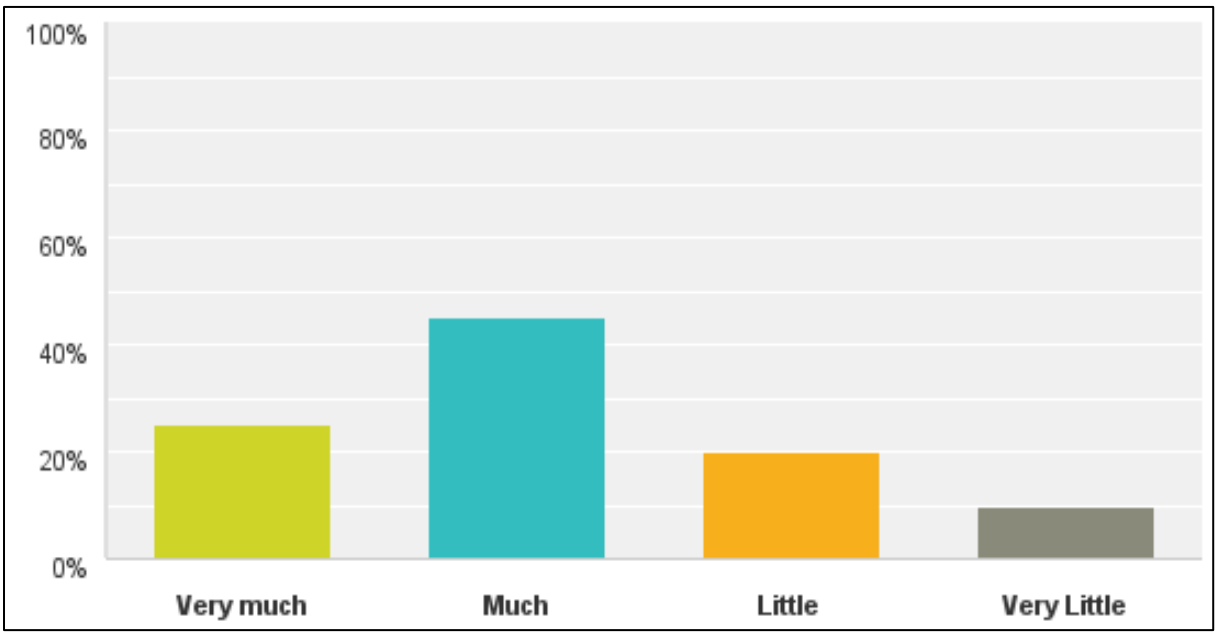
Figure 10. Perception of UNESCO-IHE's research at the global level



Source: *IOS, 2016*

108. International water scholars, too, confirmed the impact of UNESCO-IHE's research at the global level. Sixty-five percent of respondents (*n*=14) stated that UNESCO-IHE's research influenced global water policies either much or very much (Figure 11).

Figure 11. International Water Scholars' Perception of UNESCO-IHE's research impact at the global level



Source: *IOS, 2016*

109. UNESCO-IHE research was very innovation-driven. Thanks to its knowledge of real-world water-related issues and superior track record of applied research, the Institute received a number of grants and honorary prizes for its innovative[41] products, services and processes in a number of

[41] According to several UNESCO-IHE staff, the word innovation implied a good or product that enters the market and respond to a specific demand. However, the fact that the Institute did not patent some of its innovative

water-management related areas (Table 25), as per the overview of the Institute's unconventional inventions (Annex 6). More recently, one of the UNESCO-IHE's associated professors is in charge of a special volume on Water Innovations in the *Journal of the Cleaner Production*.

Table 25. UNESCO-IHE Innovations for Water and Development

Area of Innovation	Number of Projects
Safe Drinking Water and Sanitation	33
Water Related Hazards and Climate Change	32
Water and Ecosystems Quality	35
Water Management and Governance	33
Water, Food, and Energy Security	23
Information and Knowledge Systems	32

Source: *UNESCO-IHE, 2014*

110. The emergency Sanitation Operation System (eSOS) smart toilet, for instance, developed by UNESCO-IHE, was assigned the Africa Water Leadership Award 2014 for the Most Innovative New Technology of the Year. It was selected as Crossover Innovation with Impact 2014 by the Federation of Dutch Creative Industries. As it provides a sustainable, holistic and affordable sanitation solution during the aftermath of a disaster, this product became the entry point for a closer dialogue with other UN organizations (UNHCR and UNICEF) as well as other organizations working at the forefront of natural calamities in developing countries (Figure 12).

Figure 12. UNESCO-IHE Innovation Example: the eSOS smart toilet

The eSOS toilet is being tested in the Philippines for functionality and acceptance. This lightweight, easy-to-maintain toilet is equipped with sensors that collect the relevant data using a specially designed operation software. Based on this information, the separate urine and faeces tanks can be emptied at precisely the right moment to be processed into water and fertilizer. Also, by tracking the individual user's data, experts can identify imminent malnourishment or dehydration (diarrheal disease) at an early stage. The toilet fits in a compact package that is easy to transport - the shipping pallet transforms into the toilet's foundation during installation. The water tanks are incorporated into the walls and the urine tank is part of the stairs. The aim was to make this toilet as functional as possible for the lowest possible price.

Source: *UNESCO-IHE, 2014.*

research products, which is consistent with the UN Mission of making affordable development solutions available to all, confers upon the Institute's market-oriented orientation a more ethical connotation.

2.7.3. Enabling Factors

111. **The trans-disciplinary content of UNESCO-IHE research:** this was promoted not only through the cross-fertilization occurring across chair groups within departments and across departments but also through the collaboration among individuals with different - and yet complimentary - professional backgrounds and region-specific knowledge of water-related issues.

112. **A contextually relevant understanding of water management:** this was enhanced by well-targeted research initiatives established by UNESCO-IHE staff in collaboration with regional and national research centers, both within and outside of the Netherlands. This was the case of the SWITCH (Sustainable Water in Tomorrow's City's Health) programme, funded by the European Commission (21.3 million Euro) and completed in 2012. Consisting of a partnership with 32 other organizations operating in 15 countries and aimed at the implementation of 177 research projects led by the Institute, this programme created innovative solutions to water problems over a period of five years and was awarded the IWA Sustainability Award in 2012. Another example was that of the UNESCO-IHE Partnership Research Fund (UPaRF), funded by the DUPC cooperation's research cluster and consisting of 45 locally owned research projects with more than 50 partners in 37 countries.

113. The direct access to organizations (e.g., water companies, water boards, industry and municipalities) and countries that were dealing with water-related issues; and a good understanding of both their challenges and good practices. This factor was undoubtedly enhanced by UNESCO-IHE's strong alumni network, which included high-profile water specialists and decision-makers in over 60 developing countries.

114. The entrepreneurial spirit of the Institute's researchers and teaching staff who were constantly on the quest for research funding from multiple sources (e.g., Dutch government, European Commission, foreign countries' governments, international organizations) and who were billable for 80% of their time. In this vein, one of the Institute's most recent successes in responding to international competitive calls for research funding was the award of two new research tracks under the European Commission's FP7 programme: one focused on the citizen's collection, monitoring and dissemination of water information (the We Sense it- Citizen Observatory; funding available: 8 million Euro) and the other one geared towards water risk-prevention through a knowledge-based approach (KULTURisk; funding available: 4.4 million Euro). Similarly, UNESCO-IHE was able to fully tap into (and enhance) its own student body's research capacity during the implementation of a US$11 sanitation project in East Africa and South-Asia sponsored by the Bill and Melinda Gates Foundation: a total of 5 post-doc researchers, 20 Ph.D. fellows, 60 MSc. students, 500 online course participants and 130 man-years of research[42].

115. The quantity and quality library facilities available to students and staff. The Institute's library provided access to over 35,000 printed titles, including over 1420 Master's theses and 143 Ph.D. dissertations, over 11,000 peer-reviewed electronic journals, and several abstract and citation databases. The library relied on the advice of the Library Committee (LC). The LC was formed by academic staff members from every scientific department. The members provide inputs in the development of the strategic plan (e.g., new acquisitions and management of the library collections) in accordance with the existing 'collection management and development policy'.

116. The systematic integration of UNESCO-IHE research into the Institute's MSc. programmes at programme and specialization levels (43 out of 106 ECTS in Delft-based programmes were directly related to the MSc. thesis research).

117. **The demand-driven nature of UNESCO-IHE research**: the Institute's research work addressed questions that were consistently aimed to tackle real-world problems with high societal relevance. In this vein, some of the most relevant research projects recently conducted by the UNESCO-IHE include the following (for a more exhaustive list see Annex 5) (Table 26):

[42] UNESCO-IHE Annual Report 2013, p. 30.

Table 26. A sample UNESCO-IHE Research projects.

1.	Global Earth Observation for integrated water resource assessment
2.	ICT for Water Resource Efficiency
3.	Dutch-Palestinian Academic Cooperation Programme in Water
4.	Monitoring saltwater intrusion to safeguard drinking water supply in Maputo, Mozambique
5.	Assessment of Climate Change driven variations on future longshore sediment transport rates along the coast of VietNam
6.	Potentials for Peace building: Examining linkages between WASH services and conflict in UNICEF Uganda programmes
7.	Experimenting with practical transition groundwater management strategies for the urban poor in Sub Saharan Africa
8.	Alternative approaches and tools for improved water supply sanitation for towns in Northern Uganda
9.	Performance Enhancement of Water Utilities in Kenya
10.	Mekong Modeling Phase 2
11.	Accounting for Nile waters: connecting investments in large scale irrigation to gendered reallocations of water and labor in the Eastern Nile basin
12.	Codifying water rights in contested basins of Afghanistan
13.	Translating Groundwater Policy to Practice in Jakarta, Indonesia
14.	Integration of the ensemble weather forecasting systems and hydrological models for uncertainty-based flow forecasts for Huaihe (Xiangyi Kong)
15.	Quantifying environmental risk due to coastal flooding in Bangladesh

118. The sharing of research values among staff and students: Research was also inspired by a set of valued agreed upon by the Institute's staff: scientific excellence, commitment to high societal impact, interdisciplinarity and transdisciplinarity, collaboration and partnerships.

119. Research as driver of organisational change: the unmet research needs of the Institute's staff led to the revision of the Institute's internal organizational structure. In 2012, the number of departments was modified from 5 to 3 and, as a result, cross-Chair group cooperation as well the creation of new Chair Groups (e.g., in Flood Resilience and Water Governance) were encouraged in name of the need for a stronger emphasis on social science and a better understanding of the interactions between the human and natural systems.

120. The effective research findings dissemination strategy: UNESCO-IHE staff committed to making the findings of their research available to non-scientific audiences and, as a result, presented the results of their investigations in more accessible formats than what their colleagues at counterpart institutions would normally do. Such outlets included Water21, H2O, UNESCO's World of Science and blogs. Likewise, the Institute co-organized political oriented meetings (less scientific in nature), such as the Water Security and Peace Dialogue in The Hague in November 2013 or the New Nile Perspectives in May 2013.

121. The non-commercialization of research results: Consistent with its open access orientation, UNESCO-IHE allowed a wider dissemination of critical water-related information (e.g., the recent books on 'Experimental methods in wastewater treatment methods' and 'Faecal Sludge management' as well as concrete patent-free products (e.g. machines or tools that provide technological solutions to complex water problems).

122. The establishment of a performance-driven Human Resources Policy: Performance & Development Management System was well received by all staff as it promoted academic leadership and set specific academic and outreach targets for every staff member. Thanks to the new regulations, promotions within the Instituted started being clearly based on the achievement of high academic outputs, as well as on the active professional involvement in the scientific community and on the generation of outreach/societal impact.

2.7.4. Challenges

123. Reaching an adequate balance between the education programme and research activities: striking a balance between the two is a very common challenge in the contemporary academic world.

124. Mitigating the risk of mission drift: A tension seems to exist between the necessity for the Institute's staff to “run after contracts” so as to deliver short-term advisory services and enhance the Institute’s financial profitability and the responsibility to enhance the quality of its academic programme as well as the volume of academic publications.

125. Strengthening the linkages with UNESCO IHP: semi-structured interviews and a review of past programmatic documents reveal that a loose link exists between the UNESCO-IHP research agenda and the UNESCO-IHE research conducted by the Institute’s MSc. and Ph.D. students and that this is an area where the coordination could be strengthened and UNESCO-IHP could play a more active role.

126. Strengthening MSc. and Ph.D. thesis topic selection process: While the MSc. thesis research phase was praised by many students as one of their academic programmes, some other students complained about the research topic selection process: those with less research experience felt that they could have received more guidance to choose a suitable topic consistent with their background and interest. Others recommended that the research topic be established upfront before the selection of the electives courses. Some others complained about the relatively short duration of the research phase (27% of master students in the 2013-2015 cohort complained that too little time prevented them from fully achieving the goals of the MSc. research). Likewise, those with less interest in research recognized that an internship with an international NGO would have been more profitable to their professional development.

127. Finding more suitable metrics to assess the impact of research: UNESCO-IHE's research productivity, despite the significant increase experienced after 2012, was still not comparable to that of other academic institutions. However, if one considered the criteria used to judge research quality (e.g., number of articles published in high-impact factors journals) and if one considered UNESCO-IHE focus on development issues (as attested by the diversity of its student body), then it was clear that the current bibliometric analyses would never be able to capture the quality and impact of UNESCO-IHE research. That led to a more general reflection on the adequacy (or lack thereof) of metrics currently used to assess research and education quality in academic institutions located in developing countries or enrolling a large number of students from developing countries, as suggested by some specialized literature (Garfield, 1997; Tussen Visser & Leeuwen, 2002; Shiel, Filho, do Paço & Brandli, 2016).

2.8. Capacity Development

Key Message

UNESCO-IHE’s capacity development initiatives consisted of numerous tailored activities and contributed to *inter alia* favourable social and political environments in countries and regions concerned.

128. Over the years, UNESCO-IHE engaged in multiple institutional strengthening projects and provided advisory and consultancy services to knowledge institutes, water sector organizations, knowledge networks and UNESCO member states. Through these operations, the Institute increased its global impact and helped to build sustainable organisations that properly manage water resources and deliver water services sustainably (Box 6).

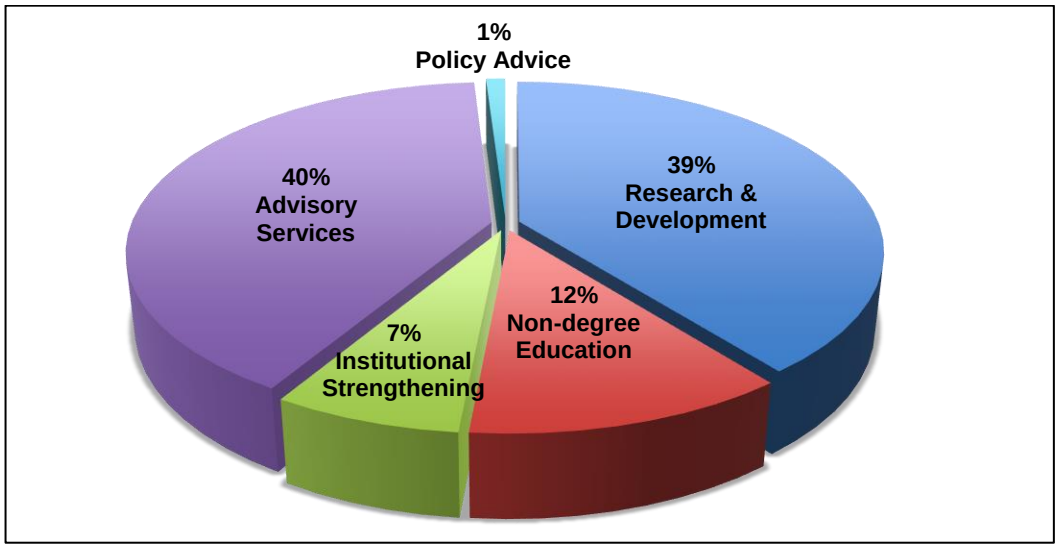
Box 6. Capacity Development: Definition

Capacity Development (CD) is nowadays approached as a multi-dimensional reality, involving four interrelated levels, i.e. individual, organizational, enabling environment and civil society (Alaerts, 1999; UNDP, 2010; Alaerts and Kaspersma, 2009; Slinger et al., 2010). As such, CD can take place as part of broader country or sector institutional development processes such as decentralization of water management responsibilities to districts, deregulation and autonomy of water sector organizations (such as utilities and water user associations), and creation of appropriate structures and institutions for integrated water resources management. It also takes the form of education, research and innovation, organizational improvement (e.g. human resources management, strategic management, knowledge management), awareness creation and understanding of water use and value by communities and civil society, development of national and supra-national networks, etc. Traditionally, formal education, training and technical assistance have been the major CD mechanisms; however, the past years have seen the introduction of innovative mechanisms such as benchmarking, networks and water operator partnerships.

Source: *Adapted from Mvulirwenande, Wehn & Alaerts (2011).*

129. In 2014, CD activities constituted 42.51% of UNESCO-IHE's total annual turnover. 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 (Figure 13).

Figure 13. Capacity Development Projects (by type) in 2014



Source: *Wehn, Irvine, Jaspers, Douven, Pathirana and de Ruyter, 2015*

2.8.1. Key achievements (Outputs)

130. Between 2010 and 2015, the Institute engaged in a number of capacity development (CD) activities and established closer links with networks and umbrella organizations around the world (e.g. World Water Forums, IWA, PPP forums) as part of its institutional strengthening programme aimed at national, regional and international agencies and entities responsible for the management of water-related services and programmes around the world. The Institute's CD activities were wide-ranging, from the provision of tailored training to a critical mass of water authorities' officials (62 short-courses delivered to 359 professionals in 2012) to the supply of policy advice to Ministries of Environment in many different countries[43] (Table 27). The main sources of funding for the implementation of CD activities were the Dutch Government, the European Commission and other international organizations, as well as countries' governments themselves.

[43] ibid.

Table 27. UNESCO-IHE Capacity Development: Key Activities

Education and training	Joint Research	Advisory services and support/guidance for:	Knowledge Networking & Partnerships
• Standard course material • Tailored course material • Workshops • Classroom teaching • Awareness-raising campaigns • Apprenticeships/on-the- job training • Train-the-trainers • Study tours /visiting organizations • Action learning	• Research partnering • Co-authoring with local experts/researchers MSc., Ph.D., postdoc	• Compilation of strategy / policy / research agenda • Curriculum development • Needs assessment / requirements analysis • Change management, knowledge • Management, policy development and implementation earning & distance learning • Online courses • Online resources (e.g. films, video-clips, such as TEDtalks) • online platform (e.g. Moodle)	• Formal networking of academia & policy makers • Water education networks • Communities of Practice • Conferences • Alumni networking • Informal networks

Source: UNESCO-IHE, 2015

131. Thanks to Dutch government's funding, UNESCO-IHE implemented over 60 CD projects, especially in Africa or Asia. With the resources made available by the Netherlands Initiative for Capacity development in Higher Education (NICHE), UNESCO-IHE managed 25 CD projects in a dozen countries (total funding: US$8.4 million) and delivered 42 refresher courses and 26 tailor-made-training programmes in over 40 countries (total funding: US3.5 million of euro). Likewise, within the scope of the Bangladesh Delta Plan 2100 Programme (BDP2100) established by the Bangladeshi government in collaboration with the Dutch government, UNESCO-IHE implemented a capacity development programme targeted at both the central government institutions in Bangladesh, as well as different research institutions and water authorities. The stakeholders' workshops and tailor-made short course included modules on adaptive planning, adaptation tipping points and pathways development so as to make the national water policy more flexible (e.g., through the use of so-called delta-ateliers, water-related issues and proposals are discussed with regional and local stakeholders).

132. UNESCO-IHE also implemented umbrella capacity development programmes within the scope of large projects funded by international organizations, such as:

- EuropeAid: UNESCO-IHE received 2.7 million euro for the implementation of six projects, including one aimed to enhance the performance improvement of Water Utilities working within the ACP-EU framework (500,000 euro) and one on the strengthening of the Cuban Food Production and Aquaculture Sector (825,000 euro);
- European Commission: UNESCO-IHE received 650,000 euro to create the Africa Water Innovation Alliance (AfriAlliance); 1,1 million euro to promote human-sensed data in the environmental sector (Ground Truth 2.0); 400,000 euro to develop improved Drought Early Warning and Forecasting to strengthen preparedness and adaptation to droughts in Africa (DEWFORA);
- Asian Development Bank (ADB)[44]: UNESCO-IHE received a USD 2.5 million support from the Water Financing Partnership Facility to provide technical assistance to 19 ADB's Developing Member Countries within the scope of large water operations management;
- Bill and Melinda Gates Foundation: UNESCO-IHE received a USD 11.0 million funding in 2013 to implement the largest research and capacity-building project for pro-poor sanitation

[44] UNESCO-IHE Annual Report 2013, p. 29.

ever conducted, within the scope of the project called 'Sani-UP: Stimulating Local Innovation on Sanitation for the Urban Poor in Sub-Saharan Africa and South-East Asia' [45]; and

- UNDP Iraq: UNESCO-IHE provided tailor-made courses to the Water Resources Ministry of Iraq in 2012 at the request of the UNDP national office.
- National Governments: UNESCO-IHE engaged in the provision of targeted policy advice to national governments. In 2012, UNESCO-IHE staff conducted two international water missions to Myanmar and Iran to deliver specialized technical training to water officials. In Iran, besides training over 3,500 individuals on water supply and sanitation across the country, UNESCO-IHE arranged field trips for senior staff.

2.8.2. Key Achievements (outcomes)

133. Based on the review of past evaluation reports, especially those related to the larger CD programmes funded by the Dutch government, several outcomes of UNESCO-IHE's technical assistance and advisory work were identified. The DUPC annual report 2012, for instance, highlighted three major medium-term and long-term achievements in this area:

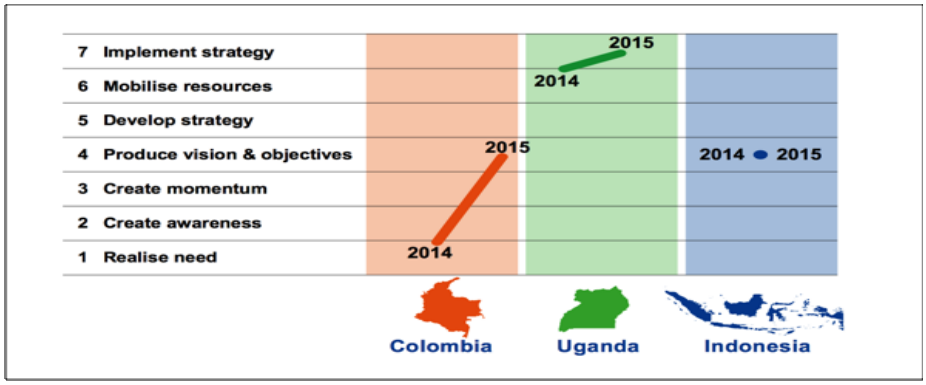
- The institutional strengthening of over 80 institutes in 40 developing countries: UNESCO-IHE clients and partners were normally in leadership positions in their respective organizations and, following their participation in capacity building sessions organized by UNESCO-IHE, generally incorporated lessons learned and good practices on water management into their institutional processes and policies;
- The systematic introduction of diplomatic and political considerations in the development of water policies and regional strategies around the world: UNESCO-IHE policy advisory work was consistently geared towards the resolution of issues related to the use and control of trans-boundary water in a number of regions around the world (e.g. Nile, Mekong, Zambezi, Incomati, Lake Victoria, Ganges/ Brahmaputra, Aral Sea etc.); and
- The joint development of academic curricula for water professionals became in and of itself an entry point for the capacity development of academic and research institutions in developing countries: this allowed building the curricula upon local knowledge and maximizing the opportunities for co-funding of the training programmes in question.

134. More recently, UNESCO-IHE coordinated workshops and training sessions in three countries (Colombia, Indonesia and Uganda) aiming to equip their respective Ministries of Water (and Environment), NGOs and universities, with concrete tools and guidelines to enhance the national water system' capacity (Table 14). UNESCO-IHE's work had the following effects:

- The operationalization of the existing water strategy in Uganda through the set-up of focal contact points for strategy implementation;
- The prioritization of national water sector CD strategy in national policies and the set-up of better communication strategy within the national water sector in Colombia in view of the continuity of the national strategy development; and
- A structured and better coordinated capacity development efforts in Indonesia (all the participants of the UNESCO-IHE workshop in December 2015 signed the 'Bogor declaration' according to which Indonesia's water crisis will be addressed by a National Knowledge and Capacity Development Strategy for Water Resources Security; such declaration was handed over to the daily secretary of the National Water Council and the suggestions included in it were well received by the national government).

[45] UNESCO-IHE Annual Report 2013, p. 30.

Figure 14. Impact of UNESCO-IHE's capacity development: Three examples



Source: *UNESCO-IHE, 2015*

135. Other medium-term outcomes produced by UNESCO-IHE's capacity development work included the following (Table 28):

- The technical enhancement of existing national curricula in water management: the introduction of new water-related theoretical models or innovative technologies built on the existing local knowledge and practices in Armenia, Benin and South Africa;
- The applied nature of UNESCO-IHE's research and educational model as well as its long experience in dealing with policy makers in a variety of contexts contributed to reducing the gap between its local partners and decision-makers at the national and regional levels in Indonesia;
- Besides improving the quality and effectiveness of water and sanitation services for the poorest population groups in many of the countries where its capacity development was aimed at NGO staff and local water authorities, UNESCO-IHE contributed to the integration of efficient knowledge management practices in different National Water and Sewerage Corporations (NWSC) in the Mekong region; and
- UNESCO-IHE policy advisory work contributed to the development of the Advanced Centre of IWRM in India.

Table 28. UNESCO-IHE Capacity Development results: A few examples

CD Project	CD Modalities	Outputs	Outcomes
NICHE Projects (17 in 2014)	• Armenia: Training of Trainers (ToT) and Curricula Development on Integrated Water Resources Management • Benin: Tailor-Made Training (TMT) on Wetlands and Food Security • South Africa: TMT on Faecal Sludge Management	• 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	• Improved training on the targeted subjects by the local knowledge institutes and universities
Knowledge Networks (e.g. NBCBN, ASKNet, AWARENET; CKNet Indonesia)	• Communities of Practice to address real-life water- related problems of immediate interest to policy	• Research outputs and scientific information and knowledge that are meaningful for policy making, disseminated as policy and planning tools that can be	• Improved science-policy interface for water governance by contributing to a fruitful and dynamic interaction cycle

CD Project	CD Modalities	Outputs	Outcomes
	makers	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)	between policy and the scientific communities
Capacity Development for Performance Improvement of Water Utilities in Secondary Urban Centres in East Africa	• Self-assessment of individual and organisational capacity needs • Action learning to develop Performance Improvement Plans • ToTs on didactical skills	• Performance Improvement Plans for three East African utilities • Accreditation of National Water and Sewerage Corporation (NWSC) experts	• Improved pro-poor services • Performance Contracts • Improved Knowledge Management practices at NWSC • Improved staff motivation
Mekong River Commission (MRC) Competency Framework for Integrated Water Resources Management (IWRM)	• Joint development of a module-based competency framework for IWRM at the MRC	• 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
Support to the Advanced Centre of IWRM (AC-IWRM) for developing competency profiles for integrated water management for the State of Karnataka, India	• Workshop Interviews	• Report with concrete recommendations for training and certified levels for IWRM professionals	• Input for development of the Advanced Centre of IWRM

Source: Wehn, Irvine, Jaspers, Douven, Pathirana and de Ruyter, 2015

136. Although the societal impact of numerous capacity development activities implemented by UNESCO-IHE was hard to evaluate (as is the case of most capacity development projects in development contexts), the clients' level of satisfaction, the feedback provided by the Institute's alumni and the renewal rate of technical assistance contracts signed by funders and developing countries themselves, seem to suggest the positive contribution provided by the Institute in this area.

Dimension three: COMPLEMENTARITY

Key Message
UNESCO-IHE strong networks of water specialists with teaching, research and capacity development experience along with its own alumni network and its ability to rapidly mobilize staff, enable that expert advice be available at the global level and, therefore, make the Institute a significant member of both the UNESCO Water Family and UN Water.

2.9. Assessing UNESCO-IHE's comparative advantage within the 'UNESCO Water Family'

137. UNESCO-IHE belongs to the so-called UNESCO Water Family, a conglomerate of UNESCO-affiliated entities (e.g. centres, institutions and programmes) with a vested interest in water (Table 29).

Table 29. The UNESCO Water Family

The International Hydrological Programme (IHP): Coordinated by the IHP Secretariat (within the Division of Water Sciences in the UNESCO Science Sector) and governed by the IHP Intergovernmental Council, this is the only intergovernmental programme of the UN system devoted to water research, water resources management, and education and capacity building. IHP Strategic Plan is defined by UNESCO Member States as the overarching framework which the work plans of all members of the 'UNESCO Water Family' should be aligned with. In principle, IHP national committees should be functioning in all UNESCO Member States to enable the implementation of the IHP Strategic plan in countries.
The UNESCO-IHE: it is the only Category 1 Institute specialized in water. It conducts education, research and capacity development activities and is functionally autonomous with its own Governing Board.
Water Centers under UNESCO auspices, or Category 2 Centers (total number as of April 2016: 39): they contribute to the IHP Strategy by conducting research and education in their respective areas of expertise (as well as other activities) with a national, regional and/or global scope.
Water Chairs (total number as of April 2016: 37): they are UNESCO Chairs in various universities over the world, involved in teaching and research activities on water-related issues.
The World Water Assessment Programme: An UN-wide programme hosted by the UNESCO Secretariat based in Perugia (Italy) and jointly implemented by 31 UN agencies whose primary objective is provide water managers and key decision-makers with the information, data, tools and skills necessary to enable them to effectively participate in the development of sustainable water policies.

Source: UNESCO website

138. As the division of tasks and responsibilities among the different members of the UNESCO Water Family has not always been very clear (except for WWAP which is more directly responsible for the production of the World Water Development Report, the Water Centers, the Water Chairs and UNESCO-IHE have overlapping responsibilities in the area of water-related research and education), it appeared quite useful to identify UNESCO-IHE's comparative advantage vis-à-vis all other UNESCO partners involved in the water sector. Such an exercise was expected to be all the more beneficial as it would allow:

a. Reducing overlaps and possible areas of competition within the UNESCO Water Family;

b. Enhancing the efficiency of current collaborations and identifying new areas of collaboration;

c. Clarifying roles and responsibilities among all the Water Family members; and

d. Positioning UNESCO's work on water more clearly in the global arena of international initiatives and institutions.

2.9.1. Complementarity between UNESCO-IHE and IHP

139. From the very beginning, UNESCO-IHE was defined as the IHP "education/capacity building arm", as reported by the majority of UNESCO IHP staff interviewed in the course of this

evaluation. However, far from confining itself to the delivery of water-related training courses, UNESCO-IHE got increasingly involved in such areas as research, policy advice and technical assistance with a specific focus in developing countries, similarly to what the UNESCO Water Division and the IHP Secretariat had partly – but differently – been doing in the earlier decades.

140. Thanks to its three-pronged strategy (e.g., developing and implementing international education, research and capacity development programmes focused on water), UNESCO-IHE soon became recognized within the UNESCO Water Family for its intellectual and scholarly contribution to the international water community. Likewise, UNESCO-IHE's popularity grew over time thanks to the thriving network of water consultants/scholars/advisors/innovators associated with it (e.g., their enrolled students and alumni served as UNESCO-IHE ambassadors in their own countries following the completion of their Master's or Ph.D. in Delft).

141. The complementarity between UNESCO-IHE and the IHP Secretariat was enhanced by the close relationship between the IHP Director and the UNESCO-IHE Rector during its earlier years of operations. The fact the former IHP Director became the UNESCO-IHE Rector in 2009 further enhanced better coordination within the UNESCO Water Family, including the development of joint work plans and sharing a common voice on a number of water-related issues46.

142. While it appeared reasonable at the very beginning of this evaluation to identify the UNESCO-IHE comparative advantage over the other members of the UNESCO Water Family, the numerous interviews conducted with stakeholders at all levels suggested that, in light of the vast organizational cultural differences between UNESCO IHP and UNESCO-IHE, it would be more appropriate to highlight those areas of work in which the latter was not simply better than others but rather unique. Many respondents, both within and outside of UNESCO, specifically suggested that each member within the UNESCO Water Family should select a specific niche of specialization in which to get fully involved rather than seeking areas of joint implementation. Many respondents stated that this would be particularly justified in the case of UNESCO-IHE in light of its exceptional nature: overlooking such uniqueness – respondents said – would be detrimental to an effective understanding of its added value to the UNESCO Water Family.

143. According to respondents, UNESCO-IHE exceptional nature consisted in the four following factors:

a. The Institute's 40-year legacy of having functioned as an independent Dutch institution of higher education before becoming a UNESCO Category I Institute;

b. Its business-oriented model that allowed it to seek and receive funding directly from countries in exchange for the provision of capacity development and technical assistance services;

c. Its agility to deploy teaching and research staff on the ground in developing countries; and

d. Its active network of alumni and new generation of water specialists who could potentially serve for the promotion of UNESCO principles around the world.

144. Likewise, respondents acknowledged, for a more effective partnership between UNESCO-IHE and IHP within the UNESCO Water Family, the IHP's uniqueness (mostly its international policy work and its direct access to countries' government) could be leveraged and its benefits shared with UNESCO-IHE. When asked what IHP initiatives were most of interest to them, most of the UNESCO-IHE staff interviewed were not too familiar with the IHP activities and programmes (the same was true for UNESCO Natural Sciences Sector staff when asked to identify specific UNESCO-IHE research or training programmes which they were interested in). A lack of in-depth mutual knowledge was quite apparent and so was the tendency to hold a pretty fixed view of each other, often based on sporadic contacts established in the past (Table 30).

[46] Following the departure of the UNESCO-IHE Rector in 2012, the relationship existing between UNESCO-IHE and IHP started being challenged by:

- The UNESCO Natural Sciences Sector's increasing demand that UNESCO-IHE become fully compliant with existing Category I Status regulations, as envisaged in its Founding Document; and
- The UNESCO-IHE's growing reluctance to accept what it considered then to be UNESCO's external interferences that could compromise its functional autonomy and academic freedom.

Table 30. Respondents' Characterization of UNESCO-IHE and UNESCO IHP

UNESCO-IHE	UNESCO IHP
A knowledge institute, Action-oriented, demand- and implementation driven, interdisciplinary, research-focused, flexible, risk-taking, financially viable, very driven, striving for academic excellence, skilled at maximizing the funding opportunities made possible from both being a UN-affiliated organization and a Dutch Law-based institution, social media-oriented, communication savvy, vehicle of Dutch water and foreign policy, academic entrepreneurship.	Policy-oriented, ethical, committed, impartial, understaffed, low-resourced, bureaucratic, formal, compliance-driven, not legalistic, privileged interlocutor of national governments, formal, well-educated, representative of all countries' needs and interests, forum to reconcile differences, independent of specific countries' contributions, enhancing the adoption of a common language.

145. When interviewed on the topic of complementarity, IHP staff stated that it was particularly difficult to see how they could be complementary to UNESCO-IHE and vice versa as UNESCO-IHE staff was billable for most of their time and therefore, their participation in meeting with UNESCO-IHE needed to be financially covered by UNESCO on ad hoc basis. The relatively lower advantage of collaborating with UNESCO-IHE staff was all the more apparent if one considers that, besides water experts from different Member States being often available to collaborate with IHP at no additional cost, the pursuit of a more intense dialogue with in-country experts (rather than the UNESCO-IHE staff based in the Netherlands) was often more in line with the UNESCO's mandate to serve - and work with - as many Member States' governments officials and scholars as possible.

2.9.2 Complementarity between UNESCO-IHE and the rest of the UNESCO Water Family

146. *UNESCO-IHE and the Water Category II Centres:* By looking at the work done by UNESCO-IHE in the various UNESCO regions and based on a review of the type and quality of its collaboration with several Category 2 Centres, the Institute played a coordination role to strengthen cooperation and to harvest synergy. An overall coordination role played by the IHP Secretariat would have become relevant at the time UNESCO-IHE was working on the Global Campus on Water Education and Research, which eventually was never established, and is no longer being planned.

147. UNESCO-IHE and the Water-related Chairs: While the complementarity between the research projects conducted by UNESCO-IHE staff and the UNESCO Chairs seemed obvious, none of the UNESCO-IHE staff interviewed was actively engaged in any activity or programme with Water-related Chairs and not specific suggestion or comment was provided on how to enhance their respective complementarity.

148. UNESCO-IHE and WWAP: Based on one of the recommendations included in the 2015 WWAP evaluation conducted by IOS, UNESCO-IHE and WWAP recently took some steps to coordinate their respective work more closely so as to make their programmes more complementary. As of March 2016, the WWAP team had already shared with UNESCO-IHE the 2017 Report theme (wastewater and untapped resources) asking them to provide some inputs. As of 2015, UNESCO-IHE was promoting the WWDR in some of its courses and during other public events. In return, WWAP, IHP and the rest of the UNESCO Water Family (e.g., Water Chairs and Category II Institutes) disseminated the WWDR widely, giving much visibility to the chapters written by UNESCO-IHE Staff.

2.9.3. UNESCO-IHE and the Dutch Water Sector

149. UNESCO-IHE contributed to the Dutch Water Sector in a variety of ways. On the one hand, the Institute staff served as guest lecturers at the request of Dutch firms and governmental agencies with a vested interest in water. On the other hand, the Institute worked on the development and implementation of joint capacity development and research projects in collaboration with a number of Dutch institutions and consulting firms (e.g., Deltares, etc.). This was also made possible by the fact that UNESCO-IHE belonged to the Netherlands Water Partnership and is part of the Technological Innovation Campus Delft.

150. More than anything else, the fact that UNESCO-IHE individual staff members were affiliated with multiple Dutch professional associations and that the Institute promoted linkages between Dutch companies and its programme, attested to the Institute's complementarity vis-à-vis the Dutch

Water Sector, especially when it came to promote their interests internationally, also thanks to the positive link existing between its alumni and Dutch water organizations.

2.9.4. UNESCO-IHE and other similar academic institutions and research/training centres around the world

151. Overall, UNESCO-IHE showcased a series of organizational practices and procedures that have made it quite a unique entity within the international water community. One of the Institute's unique contributions, for instance, was to have increased the number of publications authored by water specialists coming from developing countries and to have enhanced the capacity to conduct research on water-related issues in those very same countries. In this sense, its contribution was unique as it leads to higher impact as research capacity increases.

152. A benchmarking study (UNESCO-IHE 2014) conducted in 2013 and aimed at assessing UNESCO-IHE's comparative advantage over similar training institutions with a vested interest in water (e.g. the International Water Management Institute, the Stockholm Environment Institute, the International Crop Research Institute for Semi-Arid Tropics), for instance, described UNESCO-IHE comparative advantage in light of three key factors:

- Its focus: UNESCO-IHE was recognized as the only programme among those included in the sample, which was specifically focused on water (as opposed to development or environment);
- Its mission: UNESCO-IHE enhanced the capacity of developing countries and countries in transition in researching on and addressing water-related issues; and
- Its scope: UNESCO-IHE was well embedded in the Dutch Water Sector, as well as regional and international networks and its research (as well as its students' membership) spanned across all continents.

153. The same study placed the Institute's research at the same level as all other institutions included in the sample. As the comparison was based on the number of articles produced or citations received in peer-reviewed literature, it was legitimate to wonder whether UNESCO-IHE might have fared better had the dissemination of its work at conferences and other water-related international events been taken into account.

154. While UNESCO-IHE structural features or the technical quality of its education and research work are often considered as key to the Institute's success, one of the Institute's comparative advantages compared with other training institutions was its distinct set of values (Table 31) that affected its staff and programmatic performance.

Table 31. UNESCO-IHE 5 Core Values

1. Relevance & impact
Continue, in everything UNESCO-IHE does, to respond to societal need and to have impact on the water related problems in developing countries and countries in transition.
2. Academic status
Retain UNESCO-IHE's current academic status and academic freedom, which benefits staff, fellows and students alike.
3. Unique position
Conserve UNESCO-IHE's unique position as an international, multicultural, multidisciplinary institute, embedded in the Dutch water sector.
4. Functional autonomy
Maintain UNESCO-IHE's autonomy and flexibility in relation to governance, financing, decision-making and security of staff tenure.
5. Transparent governance
Ensure all governance and decision-making is open, transparent and that staff are consulted and heard without risk of negative consequences

Source: *UNESCO-IHE Strategy 2015-2020.*

Dimension four: COORDINATION

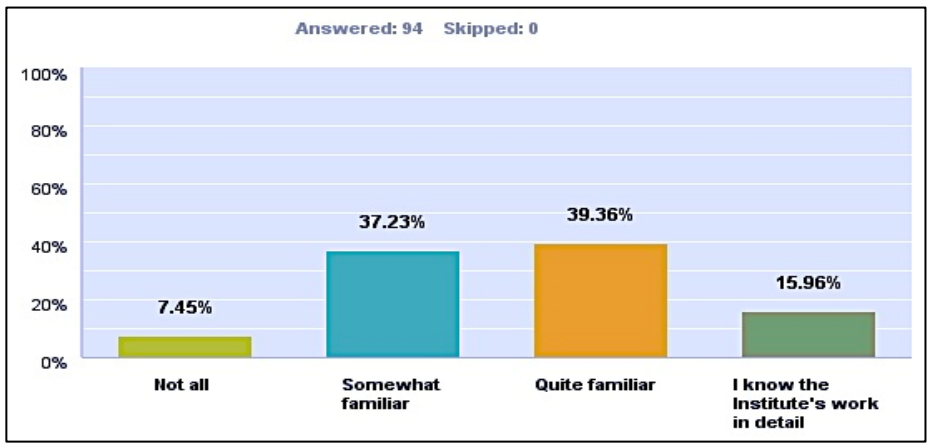
Key Message

UNESCO-IHE's coordination efforts have been successful in the Institute's three areas of work (education, research and capacity development).

Coordination with the UNESCO Water Family

155. Almost all 100 UNESCO Water Centers, Chairs and IHP National Committees that responded to the survey stated that they were familiar with UNESCO-IHE's work in the areas of education, research and capacity development (Figure 15).

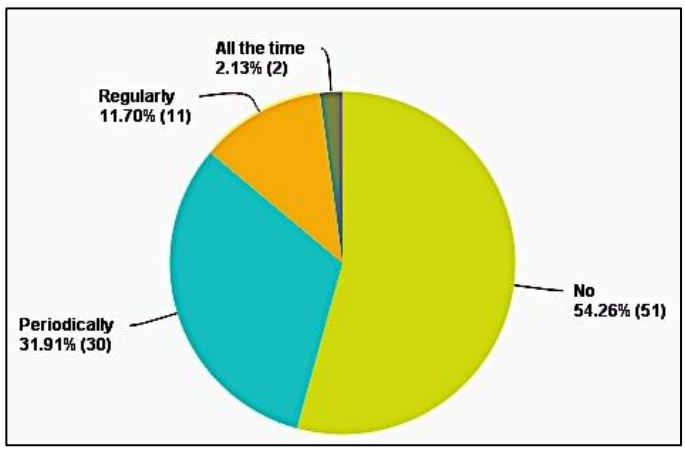
Figure 15. UNESCO Water Family's state of knowledge of UNESCO-IHE's work



Source: *IOS, 2016*

156. However, UNESCO-IHE reputation did not always translate into an effective coordination with the rest of the UNESCO Water Family (e.g., IHP Secretariat, IHP national committees, other water-related institutes, UNESCO water-related chairs)[47]. As a matter of fact, over half of the respondents (54%) (*n*=51) stated that they had never collaborated with UNESCO-IHE on any water-related matter in the past (Figure 16).

Figure 16. UNESCO Water Family's level of engagement with UNESCO-IHE

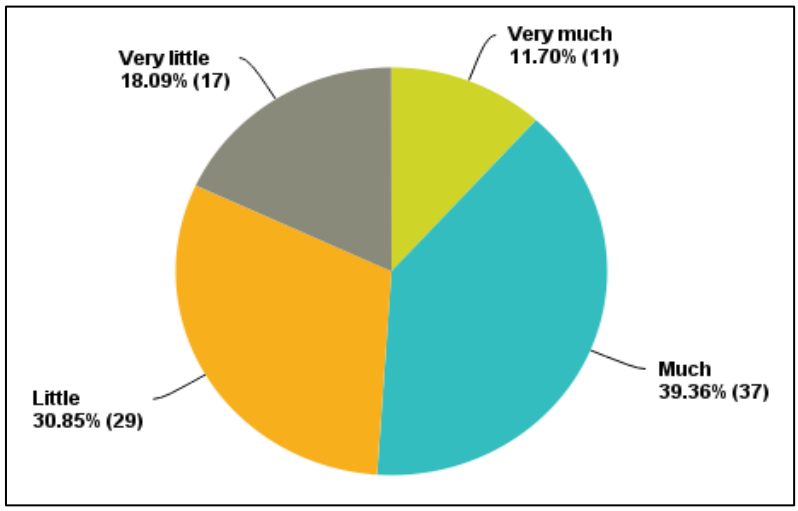


Source: *IOS, 2016*

[47] This was also confirmed by the 2013 IOS Review of UNESCO-IHE, according to which: 'there have been few incidences of structural collaboration between UNESCO-IHE and other members of the 'UNESCO Water Family' (notable exceptions are some of the Category 2 Centers and WWAP). Moreover, UNESCO-IHE's Global Campus Initiative has been developed without systematically involving IHP partners and working through IHP channels' (p.1).

157. Furthermore, when asked to what extent UNESCO-IHE's work had any impact on their own work, IHP national committees, Water Institutes and Chairs responding to the survey were divided. On the one hand, 52% (*n*=48) of them stated that the Institute had a positive impact on their own work. On the other hand, the remaining 49% (*n*=46) stated that UNESCO-IHE had little or very little impact on their own work (Figure 17).

Figure 17. Perception of UNESCO-IHE's work impact on UNESCO Water Family



Source: *IOS, 2016*

158. Overall, the analysis of the survey findings suggested two conclusions. First, the divergent views on UNESCO-IHE's impact within the UNESCO-IHE Water Family attested that the Institute had not sufficiently engaged with and contributed equally to all the UNESCO Water Family members. Second, based on the fact that the perception of UNESCO-IHE's impact was lower among those partners that had reported a lower level of collaboration with it, it appeared as though coordination was indeed a necessary (but not sufficient) condition for the Institute to play a more impactful role vis-à-vis the rest of the UNESCO Water Family.

159. As the development of a viable engagement strategy could help UNESCO-IHE to better collaborate with and contribute to the rest of the UNESCO Water Family, a closer review of the relationship existing between the Institute and all other UNESCO partners with a vested interest in water was conducted as part of the evaluation. Within the scope of such exercise, it became compelling to identify how the rest of the UNESCO Water Family could also contribute to UNESCO-IHE's work and not only the other way around.

2.10.2. UNESCO-IHE and the IHP Secretariat

160. Coordination between UNESCO-IHE and the IHP Secretariat was not always easy for a number of reasons as emerged during the interviews conducted with over 60 UNESCO and UNESCO-IHE staff members.

161. First, it was perceived that IHP's request for UNESCO-IHE's full compliance with UNESCO Category I Institute's regulations would affect its entrepreneurial and business model that was identified by many as the key driver of its own success.

162. Second, the decrease in IHP staff (between 2005 - 2016) affected the frequency of exchanges and meetings between the Paris-based staff and UNESCO-IHE. The quality of coordination deteriorated over the years to the point where not only UNESCO IHP staff would learn about UNESCO-IHE training programmes and technical assistance missions overseas from third parties (e.g. including member States) but also representatives from both UNESCO-IHE and IHP would run into each other at the same professional conferences without any prior coordination. Likewise, UNESCO-IHE staff participation in some of the meetings and conferences organized by IHP was conditional to the payment of mission costs of UNESCO-IHE staff. As a result, the frequency of UNESCO-IHE staff participation in IHP events was lower than expected.

163. Third, the drop in financial resources available to IHP prevented the maintenance of a dedicated website as well as the organization of periodic events fostering a sense of belonging among all the members of the UNESCO Water Family.

164. Fourth, a certain reluctance existed among both parties to share information with each other on their respective activities and programmes[48] (e.g., UNESCO-IHE staff would rarely report in SISTER[49], as all Category I Institutes were asked to do).

165. Fifth, the IHP's scope of work (mainly hydrology) represented only 20% of the UNESCO-IHE portfolio. As the IHP coordination of the UNESCO Water Family was not always aligned with the specific technical needs existing within the network, the interviews with several UNESCO-IHE staff suggested that more complementarity would be reached if the whole of the UNESCO Natural Sciences Sector (and not only a part of it) became its interlocutor, possibly within the scope of a more structured tripartite coordination linking UNESCO-IHE, IHP and the rest of the UNESCO Science Sector.

166. A series of actions to address the existing coordination issues were already identified on two different occasions. In 2013, the IOS review of UNESCO-IHE recommended that (i) the discussion on the topic of functional autonomy and UNESCO-IHE's collaboration and adoption of financial and administrative processes agreeable to UNESCO be adequately addressed; and the (ii) the alignment and collaboration between UNESCO-IHE and the rest of the 'UNESCO Water Family' be strengthened. Likewise, in Spring 2014, a series of joint actions were agreed upon by the IHP Secretariat Staff and the UNESCO-IHE Management Team at the end of a joint meeting organized at the UNESCO HQ in Paris[50] (Table 32). In both cases, none of the opportunities for further clarification and joint collaboration was pursued.

Table 32. Coordination and collaboration opportunities between IHP Secretariat and UNESCO-IHE (March 2014)

1. Suggested activity
Joint supervision of MSc/PhD
Synchronization between MSC and PhD theses and their contribution to IHP 8
2- Enhance mutual human resources capital
Creating mutual awareness
Sharing of outcomes and opportunities among liaison officers
IHE staff service on IHP committees, greater participation in programmes
3- Joint Communication
Joint dissemination and marketing
Organization and participation to major water events (SWWW, WWF, Forum, etc.)
4- Connecting Networks
Connecting policy networks
Connecting academic networks
Connecting funding networks
Establishing mutual internship routes

[48] Coordination between UNESCO-IHE staff and IHP responded to some minimal formal requirements dictated by the nature of their partnership: UNESCO-IHE regularly participated in IHP Bureau meetings and IHP Intergovernmental Council sessions, and reported on activities to UNESCO Executive Boards and UNESCO General Conference.

[49] This is the specific UNESCO projects results database where all UNESCO entities are required to report on an annual basis.

[50] The event, organized on March 14, 2014, was attended by five IHE representatives (including the Rector and a few Departments heads) and nine IHP representatives (including the IHP Director and several UNESCO Regional Hydrologists).

Connecting IHE alumni to intergovernmental network
IHP helping select and recruit students
Connections with UNESCO grants programmes
5- Other issues
Joint proposals for funding
Joint lectureships
Joint strategic positioning (data analysis, SDGs)
Annual plan/report of collaboration

Source: *IHP-UNESCO-IHE, Joint Report, March 2014*

167. Despite the challenges highlighted above, there were some examples of fruitful collaboration between UNESCO-IHE and IHP. Within the scope of the Potential Conflict to Cooperation Potential (PCCP) programme, for instance, both entities worked on joint publications and seminars as well as the development conflict resolution courses (e.g., the UNESCO-IHE Eco-hydrology programme staff is sharing topics with IHP through the Erasmus Mundus Masters in Eco-hydrology) in conjunction with the UNESCO Category 2 Centre for Water Law, Policy and Science in Dundee. As a follow-up, a joint MSc. specialization in water conflict management was created51. In the PCCP framework, UNESCO-IHE and IHP had also cooperated since 2009 on capacity-development initiatives for the Mekong River Commission. Furthermore, UNESCO-IHE is one of the initiators to develop a Water Diplomacy programme together with partners in the Netherlands and the Peace University in Costa Rica.

168. Other instances of co-creation of educational material or centres included the establishment in 2008 of the International Research School for Urban Water Management, as well as short courses on History of Water Management in 2010 in partnership with IHP for 14 participants. IHP also forged a collaboration with and is benefiting from the Water Channel founded with support from UNESCO-IHE, a website where educators around the world had free access to a repository of video materials about all aspects of water management.

169. Additionally, UNESCO-IHE and IHP teamed up for the World Water Fora by co-facilitating a number of sessions or sharing a common booth as of 2010. However, in this area the collaboration appeared more representational than substantive. A notable exception was the co-organization of the Regional Workshop for Europe and North America on Water Education, which addressed the objectives of the IHP-VII. There was a limited level of collaboration within the framework of different events organized under the United Nations International Year of Water Cooperation.

2.10.3. UNESCO-IHE's Coordination with the other members of the UNESCO Water Family

170. *Coordination with WWAP:* WAAP is a programme hosted and led by UNESCO that brought 31 UN water Agencies and partners together to assess the level, use and management of the world's freshwater resources and to compile all this information into an annual publication, the World Water Development Report. UNESCO-IHE was an important contributor to this report and has specifically coordinated the writing of the Report chapters more directly focused dealing with Education, Knowledge and Capacity Development, often with some input from IHP.

171. Coordination *with Category II Institutes*[52]*:* Where UNESCO-IHE's involvement in the 'UNESCO Water Family' seemed the most effective was in the area of capacity development.

[51] The 18 months programme led to an MSc. in Water conflict management with a specialization in water conflict for students enrolled in UNESCO-IHE and an LLM in water governance and conflict resolution for those enrolled at the Dundee Center. There were 10 MSc students enrolled in the 2010-2012 cohort. The modules were also offered in the form of short courses.

[52] According to the UNESCO Science Sector integrated comprehensive strategy for Category 2 Centres (35 C/Resolution 103) and the later IHP's plan for Category 2 Centres, IHP had a coordinating role vis-à-vis all the Water Centres and Centres had the responsibility to coordinate more effectively with the other members of the UNESCO Water Family: '*While each Centre retained its functional autonomy, it integrated a network where all*

UNESCO-IHE provided technical assistance and training to a number of Category 2 Centers (Box 7), especially the HidroEx Centre in Brazil (UNESCO-IHE activities with this Centre included assistance in staff and curriculum development as well as advisory services for the preparation of meetings with government officials and HidroEx participation in IHP). More recently, UNESCO-IHE assisted HidroEx in the delivery of five short courses not only within Brazil but also in Colombia and Cape Verde.

172. UNESCO-IHE also maintained regular exchanges with ICHARM (International Center for Water Hazard and Risk Management) in Japan. The Memorandum of Understanding between the two organizations, signed in May 2014, provided for the joint development of training courses on Flood Management and Disaster Resilience as well as for joint research in the context of Climate Change). UNESCO-IHE's leadership participated in the strategic planning of ICHARM as a member of its governing board, and a guest lecturer exchange was organized annually. For example, IHP invited and covered the cost of 30 students from UNESCO-IHE to participate in the Youth Ceremony for the launching event of the International Year of Water Cooperation in 2013. Due to limited student numbers, the programme was recently closed and UNESCO-IHE was looking for new partners to continue this programme (elsewhere). The two Institutes had also worked together to deliver a joint module on 'Urban Flood Modeling' and 'Urban Water Systems Modeling'.

173. More recently, UNESCO-IHE started working closely with the International Groundwater Resources Assessment Centre (IGRAC), which became a Category 2 Centre in 2012 and was located in UNESCO-IHE's premises in Delft at the time the evaluation was conducted. IGRAC-staff was involved in lectures and workshops at the Institute and vice versa. IGRAC, UNESCO-IHE and the UNESCO Namibia Field Office were also involved in the OpenWater2015 with a focus on open source software and open access tools. UNESCO-IHE coordinated with a number of other Centres and Institutes (Box 7).

Box 7. UNESCO-IHE Coordination with Category II Institutes: An Overview

- Collaboration agreement with International Centre for Water Hazard and Risk Management (ICHARM)
- Collaboration agreement with Regional Centre on Urban Water Management (RCUWM), Tehran, Islamic Republic of Iran
- Education collaboration with Regional Centre on Urban Water Management for Latin America and the Caribbean (CINARA), Cali, Colombia
- Hosting of International Groundwater Resources Assessment Centre (IGRAC), Delft, Netherlands
- Education collaboration with International Centre on Coastal Ecohydrology (ICCE), Faro, Portugal
- Institutional strengthening activities with HidroEX - International Centre for Education, Capacity Building and Applied Research in Water, Minas Gerais, Brazil

174. **Coordination with UNESCO Water Chairs:** Most respondents stated that UNESCO-IHE did not coordinate with UNESCO Water Chairs on a regular basis. Some staff mentioned that UNESCO-IHE established some sporadic contacts with two UNESCO-Water Chairs back in 2005: the one on sustainable groundwater management at the Academy of Sciences in Ulaanbaatar (Mongolia) and the one on Sustainable Water Management at Hohai University (China).

2.10.4 UNESCO-IHE's coordination outside of the UNESCO Water Family

175. Coordination outside of the UNESCO Water Family appeared smoother and better structured, as attested by the rapid increase in the number of institutional partnerships established in the areas of education and research since its creation in 2003, and in that of capacity

Centres work towards 'one UNESCO' with an overall mission to address water security and water- related challenges; Areas of functional collaboration include: a unified communication and branding strategy, joint fund raising, exchange of staff and data sharing.

development as of 2010. (Box 8). UNESCO-IHE was also of a strategic complementarity to UNESCO in opening up for new partners for cooperation.

Box 8. Impact of Partnering with UNESCO-IHE: What Partners Say

- "Staff capacity development, research and education infrastructure development, increased visibility, and increased research capacity and linkages" (Egerton, Kenya)
- "Helps us to train staff, lecture notes sharing, sharing experience, collaborative research and paper writing" (Hohai, China)
- "Such cooperation helps us to build up our capacity, profile and international reputation" (HWRU, Vietnam)
- "A permanent input and benchmarking for our activities" (University of São Paulo, Brasil)
- "Selling point in attracting new students, and new research and advisory funds from other sources" (Birzeit, Palestine)
- "This has brought in added depth into our research focus and has supported more practical MSc researches which would not have been affordable under normal budgets" (University of Zimbabwe)
- "It is very important for us in terms of capacity building, quality control, back stopping and outreach. Over the years very strong relationships have been established and continue to provide the much needed support" (WaterNet)
- "It is a strong network. It has helped building profile, identifying suitable partners for other professional and research activities." (AIT, Bangkok)

Source: *UNESCO-IHE Consultations with Partners, 2012*

176. While it was evident that coordination has been one of UNESCO-IHE core functions for a long time (a number of the Institute's existing partnerships dated back to the pre-UNESCO phase), several respondents attested that the UN affiliation as of 2003 did translate indeed into a plethora of unprecedented and successful collaboration opportunities, especially with national governments and other UN agencies.

177. Another factor that undoubtedly contributed to good coordination with the other partners was the quality of the communication and branding strategy adopted by the Institute. One other UNESCO-IHE's distinct peculiarities that allowed it to gain a comparative advantage over other actors within the international water academic and training community was indeed its investment in communication and marketing of its programme: the Institute was employing 7.26 staff (FTE) in 2016 to enhance its implementation, including a Communication Office Manager, a Junior Communication Office, an External Communication Office and a Graphic Design Coordinator (UNESCO-IHE Communication Strategy, p.10).

178. The effectiveness of the communication strategy was also attested by the good viewership results (especially in the Caribbean and Northern Africa) recorded between 2014 and 2016 (Table 33).

Table 33. Evolution of website readership by region between 2014 and 2016*

Change by Region and type of use	Total Number of Sessions	% of new Sessions	New Users
AFRICA (average)	**+61%**	**+5.30**	**+70%**
Eastern Africa	+55%	+9%	+60%
Western Africa	+47%	-2%	+44%
Northern Africa	+122%	+3%	+129%
Southern Africa	+55%	+5%	+63%
Middle Africa	+37%	+8%	+48%
ASIA (average)	**+36%**	**+1%**	**+37%**
Southern Asia	+39%	+2%	+42%
Southeast Asia	+32%	+2%	+34%
Western Asia	+50%	-9.10%	+37%
Eastern Asia	+9%	+7%	+16%
Central Asia	+65%	-15%	+40%
LATIN AMERICA and the CARRIBBEAN (average)	**+93%**	**-4%**	**+85%**
South America	+81%	-5%	+72%
Caribbean	+172%	-4%	+161%
Central America	+27%	-3%	+23%

*Time periods compared Jan. 1- May 20, 2014 and 2016

Source: *Adapted from Google Analytics*

179. As clearly spelled out in the Institute's recent Communication Office work plan for 2016, four main activities seemed to best serve the Institute's interests:

- A regular, two-way internal communication (this included the organization of staff development sessions on house style guide, glossary and branding guidelines);
- A series of marketing strategies aimed at the acquisition of more students (this would envisage better coordination between staff regional representatives and alumni in different regions, with the objective of increasing the number of 'own accounters', that is, of student with their own financial resources);"
- A well-targeted and multi-layer external communication strategy relying on the use of multiple communications channels (this would include a continued update of the mailing lists, a website refresh and the dissemination of newsletter covering different aspects of the Institute's work); and
- The maximization of alumni's role as Institute's ambassadors (this would include the identification of alumni coordinators in 10 active groups and in the provision to them of toolkits and suggestions on how to promote UNESCO-IHE.

2.10.5. Education-focused Coordination

180. Over the years, UNESCO-IHE coordinated and partnered with a number of training academic institutions (Table 34).

Table 34. UNESCO-IHE Joint Academic Programmes (2012-2014)

	Delft-based	Joint modality
Environmental Science		
Environmental Planning and Management	IHE	
Environmental Science and Technology	IHE	UniValle
Environmental Technology and Engineering		Erasmus Mundus
Environmental Technology for Sustainable Development		AIT
Limnology and Wetland Management		BOKU + Egerton
Water Quality Management	IHE	
Municipal Water and Infrastructure		
Sanitary Engineering	IHE	UniValle, KNUST
Water Supply Engineering	IHE	UniValle, KNUST
Urban Water Engineering and Management		AIT
Water Management		
Water Conflict Management	IHE	
Water Quality Management	IHE	
Water Resources Management	IHE	
Water Services Management	IHE	
Water Science and Engineering		
Coastal Engineering and Port Development	IHE	Hohai
Ecohydrology		Erasmus Mundus
Flood Risk Management		Erasmus Mundus
Hydraulic Engineering - Land and Water Development	IHE	AIT, Haramaya, Sri-Wijaya
Hydraulic Engineering and River Basin Development	IHE	
Hydroinformatics: Modelling and Information Systems for Water Management	IHE	Hohai, Univalle, Ain Shams
Hydrology and Water Resources	IHE	Hohai

Source: *UNESCO-IHE, 2013b*

181. UNESCO-IHE education-focused coordination and collaborations were undertaken under three modalities: joint degree specializations, franchising, double/multiple degree specializations (Box 9).

Box 9. Types of Education-focused Partnerships

- **A Joint degree specialization[53]:** it consists in the establishment of an academic programme whose curriculum is delivered by different partners (including UNESCO-IHE) and whose students receive a degree jointly awarded by the partners, pending the compliance with special conditions set by special joint examination regulations for the specialization concerned.
- **Franchising:** it consists in the delivery of UNESCO-IHE curriculum by partners under special examination regulations was delegated by the Institute. Students receive the UNESCO-IHE degree.
- **Double/multiple degree specialization:** consists in the delivery of the curriculum by different partners under their own examination regulations. Successful students receive the degree of each of the partners if they meet the conditions set by the respective examination regulations.

Source: UNESCO-IHE, 2013b

182. Except for the MSc. in Water Management, all other academic programmes opted for the establishment of either a joint degree or double degree partnership modalities between 2010 and 2015. Such was the case of the new Erasmus Master in Floor Risk Management (Figure 18).

Figure 18. UNESCO-IHE Joint Degree Programme: An example

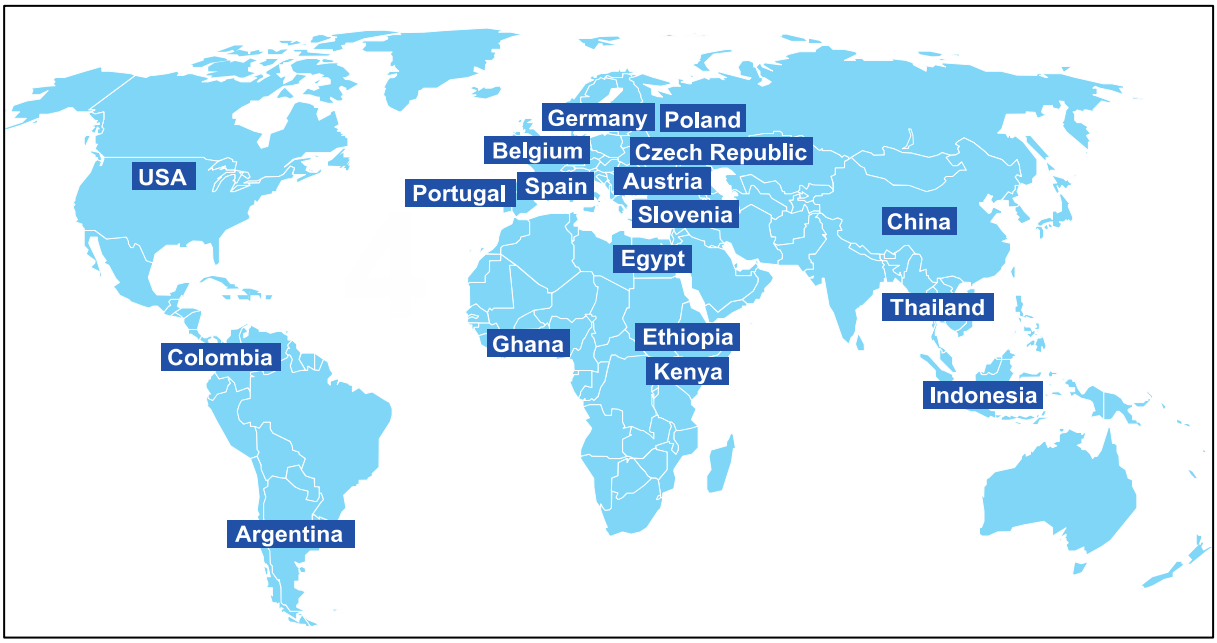
Since 2011 the Master Programme in Flood Risk Management has been offered by UNESCO-IHE in cooperation with the Technical University of Dresden (Germany), Barcelona Tech (Spain) and the University of Ljubljana (Slovenia). This innovative programme follows a holistic approach and is explicitly designed to cover a wide range of topics – from drivers and natural processes to models, decisions and socio-economic consequences and institutional environment, and is therefore an important advance in water education. Special attention is given to hands-on experience with the computer - based hydroinformatic tools and systems that are used by many consultants and governmental offices around the world. The associated members include European hydraulics laboratories, namely, DHI (Denmark), Deltares (the Netherlands) and HR Wallingford (UK), and key national organisations responsible for flood management, including Rijkswaterstaat (the Netherlands), ICHARM (Japan) and three organisations from Bangladesh. These partners bring their specific complementary expertise in flood risk management to the programme, involving students in their projects during the research phase of the study.

Source: *UNESCO-IHE, 2014.*

[53] Joint programmes are currently conducted with Egerton University (Kenya) and University of Natural Resources and Life Sciences (Austria), Kwame Nkrumah University of Science and Technology (KNUST) (Ghana), Universidad del Valle (Colombia), Haramaya University (Ethiopia), Asian Institute of Technology (AIT) (Thailand), Hohai University (China), Sriwijaya University (Indonesia), University of Lincoln Nebraska and a number of European universities.

183. Such partnerships, which spanned across all of UNESCO's regions (Figure 19), were also the basis for the development of joint research and capacity development projects (discussed more in details in the sections above).

Figure 19. UNESCO-IHE Academic Partnerships (2014-2015)



Source: UNESCO-IHE Annual Report, 2014

2.10.6 Research-focused Partnerships

184. Given the increasing relevance of water diplomacy and the rise in number of trans-boundary water projects, coordination with other academic institutions in these areas was intensified as of 2010, as attested by the growing number of research partnerships in the water sector especially in countries like the Netherlands, Belgium, Denmark and Switzerland that account for 60%-70% of all international collaborative papers, and average between 9-11 citations per paper (SIWI, 2012). A significant correlation between international publication share (percentage) and citations per paper (0.769; $p<0.001$) was found when examining publication output per country looking at the percentage international research collaboration could contribute to assess the impact (in terms of cites) of the Institute's research.

2.10.7. Capacity Development-focused Coordination

185. One of the most innovative partnerships created by UNESCO-IHE in collaboration with the Dutch Government in the area of capacity development was VIA Water (previously known as Knowledge Platform on Water for Development). VIA Water represented an ambitious programme for water innovation in Africa. The name itself (VIA) stands for Water Valorisation and Innovation in Africa. VIA Water was a platform whereby policy, knowledge institutions, business and industry and NGOs got together to develop co-creative partnerships that culminated in innovative and sustainable solutions. VIA Water did so by bringing about new connections. First, the programme sought to identify a selected number of demand-driven pressing issues (no more then 5) related to the Dutch Government priority themes in the target countries. Then, VIA Water brought together knowledge and people from different sectors and different countries to find solutions for those pressing issues. After that, funding was made available for small-scale innovations. VIA Water looked for social and supply-chain innovations rather than simply technological innovations. The innovations were developed in co-creation with the countries in Africa with which the Netherlands has a water programme.

2.10.8. Other types of coordination and collaboration

186. Apart from liaising with IHP, UNESCO-IHE has engaged in a number of national, regional and global water fora and networks:

- **Globally:** the Institute contributed to the International Association of Hydrological Science's new Scientific Decade (2013-2022) entitled 'Panta Rhey-Everything Flows' as well as to the International Council for Science Future Earth research programme, the International Water Association's Annual Key Themes, the World Water Council's work on water- and water-related related political issues, and the Grand Challenges formulated by the EU Horizon 2020 programme (the seven-year research and innovation programme of the European Union);
- **Regionally:** UNESCO-IHE strategically occupied a niche in regions where water issues dominate the political agenda; the Institute has actively contributed to fora and conferences in Africa (e.g., the Nile Basin and East Africa) and the Middle East. Similarly, the Institute provided support to knowledge network, such as the Arab Integrated Water Resources Management Network (AWARENET, Arab region), the Latin American Water Education and Training Network (LAWETNET, Latin America), MBCBN, CapNet and ASKnet);
- **Nationally:** the Institute engaged with a number of organizations that belong to research and innovation networks and programmes. These include the NWO/WOTRO programme on deltas urbanization or the CoCooN network on conflict and cooperation over natural resources, and yet a number of other initiatives known as Top Sector Water, Water Mondial and Knowledge Platform Water for Development, WaterNet (Southern Africa) and the Collaborative Knowledge Network Indonesia (CKNet-INA).

III. CONCLUSIONS

3.1 Relevance

- UNESCO-IHE's work is relevant to the UNESCO Natural Sciences Sector and to the UNESCO Water Family. UNESCO-IHE's work was most relevant to the water community in developing countries and countries in transition. The strong alumni network, the capacity development assistance (e.g., policy advisory work) and the running of dual degrees (partly delivered in Delft and partly delivered in developing countries) are the three factors that most closely link the UNESCO-IHE scientific community and the policy makers in developing countries and countries in transition.
- UNESCO-IHE's work is particularly relevant to the Dutch Government (e.g., the Ministry of Foreign Affairs, the Ministry of Education, Culture and Science, as well as the Ministry of Infrastructure and Environment). The Institute also collaborated with a large number of Dutch private firms (e.g. as partners or sub-contractors) for the implementation of research and policy advisory work in developing countries.
- UNESCO-IHE also contributed to the formulation of the Sustainable Development Goals within the Agenda 2030. Its staff were involved in the discussions that led to the development of the respective goals and in the advocacy effort for a holistic and integrated vision of water.

3.2. Effectiveness

- Overall, UNESCO-IHE's work between 2010 and 2015 has produced positive outcomes in the three areas of education, research and capacity development, consistent with its original mission and objectives. That said, the Institute has the potential to succeed even further in carrying out its universalistic mission.

Education

- The quality of UNESCO-IHE's MSc. and Ph.D. programmes was high, as formally recognized by accreditation agencies and a number of other sources.
- UNESCO-IHE's education model has set itself apart from other training institutions that offer specialized courses and degrees in water around the world for several reasons. First, the specific focus of its programme on developing countries and countries in transition. Second, a truly international student body and staff. Third, the targeting of mid-level professionals with prior work experience in the water sector. Fourth, the interdisciplinary didactic approach, which has contributed to a renewed understanding of water as a governance and diplomacy issue and not merely an engineering topic.
- Besides reducing the financial costs for students (and their sponsors) to attend a full-fledged training in Delft, the creation of joint academic programmes (in partnership with institutions based in developing countries) was especially relevant to the fulfilment of its original mission as it allowed more professionals in the Global South to learn about and act upon water-related issues right where they were identified and needed to be dealt with (field-based and solutions-oriented learning). In this vein, the Institute's education curriculum was useful to meet the water-related needs of most of the countries where its students originally came from, as also demonstrated by the leadership positions occupied by UNESCO-IHE students upon their return to their respective countries.
- Despite the achievements recorded to date, several opportunities are available to UNESCO-IHE to enhance the effectiveness of its work and the sustainability of its results on the ground. In this vein, the metrics used to measure UNESCO-IHE's impact have not always been the most adequate. As UNESCO-IHE has been partnering with many institutions over the years and has engaged in the implementation of large externally funded projects, its staff has used multiple tools to track the progress of its activities. However, in doing so, it has focused more on monitoring outputs and not sufficiently on evaluating its societal impact. In addition, the monitoring has been conducted in silos (for each one of the three UNESCO-IHE's main areas of work) and often at the activity level and the programmatic impact (of all three areas combined) has not been sufficiently captured.
- Once UNESCO-IHE training programmes received formal accreditation, the Institute started placing greater emphasis over research quality. However, the quest for academic research excellence was often competing with the need for deploying academic and research staff on the ground to provide capacity development assistance.

Research

- UNESCO-IHE's research is quite exceptional as it focuses on technical, political and social dimensions of complex water issues.
- More specifically, UNESCO-IHE stood out for three main reasons. First, its innovation-focus, which led to the invention of productions whose utilisation affected the lives of many people. Second, the close link between research and capacity development, starting from the researchers themselves: UNESCO-IHE created a new cadre of researchers from developing countries that either had no or limited prior research and publication experience before entering the programme. Third, the privileged access to national government sources and programmes to research on, in light of UNESCO-IHE's affiliation with the UN System.

Capacity Development

- UNESCO-IHE's capacity development consisted of hundreds of activities closely aligned with the Institute's research and training programmes whose primary objective was to equip organizations with better water management competencies and skills in more favourable social and political environments. Although the societal impact of numerous capacity development activities implemented by UNESCO-IHE was hard to evaluate (as is the case of most capacity development projects in development contexts), the clients' level of satisfaction, the feedback provided by the Institute's alumni and the renewal rate of technical assistance contracts signed by funders and developing countries themselves, seem to suggest the positive contribution provided by the Institute in this area.
- UNESCO-IHE's educational programmes have also indirectly contributed to capacity development in developing countries whilst a number of capacity development initiatives, whose primary objective was to equip organizations with better water-related competencies, also proved to be beneficial.

3.3 Complementarity

- The potential of complementarity within the UNESCO Water Family needs to be further explored, especially in view of the variety of UNESCO-IHE networks (water specialists, alumni) and IHP's access to national governments and water diplomacy fora.
- UNESCO's IHE has several strengths to offer the UNESCO Water Family, UN Water and the rest of the international water community. First, its strong network of water specialists with teaching, research and capacity development work experience, both in-house (over 500 between staff and guest lecturers) and outside (1,500-2,000). Second, its strong alumni network (over 15,000 individuals from over 100 countries who often occupy leadership positions in national and sub-national water agencies). Third, its ability to mobilize staff in the field within a reasonable period of time.
- UNESCO-IHP also has several strengths. First, the IHP Secretariat has a privileged access to national governments through not only the member states' delegations in Paris but also the national IHP committees, the Water Institutes and the Water-related Chairs. Second, it has a critical role in international policy-making on international water-related issues (e.g., water diplomacy). Third, in light of UNESCO's role as an impartial mediator and an ethical partner, the IHP Secretariat remains a preferred partner of choice for many countries' governments.

3.4. Coordination

- UNESCO-IHE's coordination efforts have been successful if view of the numerous partners which it joined forces in education, research and capacity development (e.g., respectively through the establishment of joint and dual degree programmes, the set-up of research consortia funded by the Dutch Programmatic Cooperation Fun, and the development of joint proposals with a host of specialized water companies, both within and outside of the Netherlands).

IV. RECOMMENDATIONS

Recommendation 1: UNESCO-IHE should continue to pursue activities, projects and programmes in education, research and capacity development making sure that all efforts in these three areas be strategically linked and complementary with each other as much as possible.

Strategic Options for Consideration

- UNESCO-IHE academic programmes should continue to emphasize the need for students to conduct applied research that will allow them to address some complex water issues in developing countries and countries in transition. Likewise, it will be important for students with a specific expertise to get involved in capacity development programmes aimed at public or private entities located in their same country or region of origin, either during or after the completion of their Master's degree or Ph.D. programme.
- UNESCO-IHE research findings should be included as much as possible in the academic curricula and the evidence generated by the corresponding publications be adequately disseminated during the delivery of tailor-made courses and technical assistance provided to organizations in developing countries. Research topics should also be identified in collaboration with developing countries' national governments and international organisations (e.g., other UN agencies).
- UNESCO-IHE technical assistance programmes in developing countries should maximize the knowledge of the Institute's academic and research staff and provide students with opportunities to test the relevance and usefulness of their own knowledge and research. Students' individualized learning objectives should reflect explicitly such stronger field orientation.

Recommendation 2: UNESCO-IHE should develop an intervention logic (e.g., theory of change) to provide a more comprehensive understanding of its work among its own staff and its external audiences. Ideally, the new tool, to be developed with the support of the whole staff, should include adequate indicators and benchmarks to better measure the impact (long-term results) of its education, research and capacity development work.

Strategic Options for Consideration

- UNESCO-IHE might want to build its intervention logic in a participatory manner (e.g., through the involvement of the different organizational units, including a few members from the Governing Board and the Foundation board) and use the intervention logic included in the 2016 IOS evaluation as a possible starting point for such endeavour.
- As the participatory formulation of an intervention logic has proved an effective entry point for the development or strengthening of a results culture within an organization, UNESCO-IHE should organize a series of workshops where each staff (regardless of the nature of their contract or their specific area of occupation within UNESCO-IHE) will become familiar and gain ownership of any monitoring and evaluation policy and tools developed in relation to the intervention logic in question. Such activity should be well coordinated with the Office of the Rector as well as the Communication Team.

Recommendation 3: UNESCO-IHE should strike a balance between its own entrepreneurial business model and its universalistic and equity-based development mission and objectives.

Strategic Options for Consideration

- For an institution like UNESCO-IHE that intends to perform successfully in a competitive environment, planning in accordance to an entrepreneurial and demand-driven business model has been critical to the growth of its portfolio over the years. However, given its original aspiration to make water management knowledge and research available to all developing countries and countries in transition, the current business model may risk turning into a limiting factor.

- UNESCO-IHE research and teaching staff (as well as students in compliance with the Dutch work regulations) should be allowed to engage in outside activity so long as the activity does not conflict with the staff responsibilities at the Institute (e.g., teaching, mentoring and disseminating water research findings at the global level, in the case of the academic staff; taking classes and exchanging with the rest of the student body in Delft, in the case of students).
- In order to maintain coherence between its fieldwork and its universalistic mission, UNESCO-IHE should become rather selective in choosing and justifying the rationale of the activities and programmes to get involved with. In doing so, UNESCO-IHE should clearly indicate which strategic objective(s) each new planned activities and programmes would contribute to, with a special emphasis on those related to both the partners' institutional strengthening and the societal impact.
- A special effort should be made so that UNESCO-IHE's online educational offering (e.g. individual courses that are not part of the MSc. or a Ph.D. module but that one could pay for and take from anywhere in the world) be as interdisciplinary as possible (e.g. through the provision of resources on the nexus between the selected course topics and a number and other development-related areas).

Recommendation 4: UNESCO-IHE should make an effort to systematize the knowledge and experience accumulated in the past by its staff working in education, research and capacity development.

Strategic Option for consideration

- **-**UNESCO-IHE should conduct systematic reviews of articles and research published in the past on a selected number of relevant water-related topics.
- -UNESCO-IHE should conduct periodic critical reflection sessions pertaining to lessons learned during technical assistance missions and other types of field assignments organized in the past.
- -UNESCO-IHE should explore further opportunities for collaboration with the Dutch water sector representatives in the field in order to (i) disseminate the findings of its systematic reviews among a wider audience and (ii) broaden the scope of the Institute's in-country networks.

Recommendation 5: UNESCO-IHE should explore opportunities for better positioning itself vis-à-vis other international organizations and within the UN System.

Strategic Options for Consideration

- UNESCO-IHE and IHP should strengthen their collaboration in the future (e.g., by linking a selected number of UNESCO-IHE MSc. and PhD research students with IHP's staff in Paris).
- UNESCO-IHE should include a specific module in all its courses that could provide students, researchers, partners and client alike, with an overview of all UN partners working in the water sector.
- IHP, UNESCO-IHE and WWAP should consider working more closely in the future, based on a tripartite coordination strategy whereby IHP could play a policy advisory role, WWAP could make global water statistics and assessments available for decision-making and UNESCO-IHE could make its education and technical assistance facilities more accessible to the other two.
- UNESCO-IHE should establish closer links with the World Academic of Sciences for the advancement of science in developing countries (TWAS) located in Trieste and boasting an elite network of more than 1,100 scientists from 90-plus countries and 30 years' experience in the global science community. The diplomacy in science summer course and all the other conferences and lectures organized on this topic by TWAS seem a particularly good fit to the UNESCO-IHE education and research programmes in water diplomacy.

ANNEX 1: TERMS OF REFERENCE

Evaluation of the UNESCO-IHE Institute for Water Education

Terms of Reference

1. Background

1.1 Establishment of UNESCO-IHE

The UNESCO-IHE Institute for Water Education (UNESCO-IHE) was established during the 31st session of the UNESCO General Conference in October 2001 and became operational in June 2003[54]. Before becoming a UNESCO Category I Institute[55], UNESCO-IHE had functioned as a Dutch educational establishment for nearly forty-six years (it was officially established in 1957). The Institute is located in Delft (the Netherlands) and its three main areas of intervention include postgraduate water education, research and capacity development for developing countries and countries in transition[56]. In total, over 14,500 water professionals and postgraduate students from over 160 countries (mostly developing countries) have studied and conducted research at UNESCO-IHE since its creation.

As a result of its historical independence and as a reflection of its unique funding model, the UNESCO-IHE governance structure has been quite unique and its operational and financial autonomy is still today greater than that of any other UNESCO Category I Institute[57] (Box 1).

Box 1. Overview of UNESCO-IHE Governance[58]

UNESCO-IHE governance structure consists of the five following functions: the Rectorate, the Governing Board, the Foundation Board, the Academic as well as the Process Management Units.

Rectorate: The day-to-day management of the Institute is handled by the Rectorate, which consists of the Rector, the Vice Rector of Academic and Student Affairs, and the Business Director. The Rectorate reports to the UNESCO-IHE Governing Board about programmatic issues and to the IHE Delft Foundation Board (as well as to the UNESCO Chief Financial Officer since 2013) on financial matters. The Rectorate provides leadership to three academic departments and six process management units.

Governing Board: The Governing Board comprises representatives of ministries, universities and the private sector. Appointed by the Director-General of UNESCO, GB members represent all UNESCO regions, as per a recommendation made by the IHP Secretariat[59]. The functions of the Governing Board include the following: (i) to determine, within the framework decided by the General Conference, the general policy and the nature of the Institute's activities through a set of guidelines for the development of the Institute's programme; (ii) to adopt the programme of work and its budget estimates; (iii) to examine the biennial and other reports on the activities and expenditures of the Institute prepared by the Rector and to advise the latter on the execution, evaluation and follow-up of the Institute's programme and other matters he/she may bring to its attention; (iv) to monitor the implementation of UNESCO-IHE's mandate as per approval by the UNESCO General Conference.

Foundation Board: The IHE Foundation, as the legal entity for higher education, is responsible for granting the academic degrees of the Institute's educational programmes. The Foundation owns the buildings and facilities that UNESCO-IHE uses, and employs most of UNESCO-IHE's staff. The IHE Delft Foundation Board, responsible for management of the Foundation, is also responsible for providing the Institute with the resources for the implementation of contracts with third parties. It consequently bears the financial risks and responsibilities on contractual matters, and is responsible for safeguarding the continuity of the Institute's

[54] The mandate and administrative arrangements of the Institute are described in the following documents: the Statutes of UNESCO-IHE (approved by the General Conference in 2001), the Seat and Operational Agreements agreed upon by UNESCO and the Government of the Netherlands (GoN), the Cooperation Agreement signed by UNESCO and the IHE Delft Foundation, and the Statutes of the IHE Delft Foundation.

[55] The UNESCO General Conference, at its 31st session in October 2001, approved the creation of UNESCO-IHE as a category 1 institute (31 C/Resolution 16) and adopted its Statutes as set forth in document 31 C/47. The following agreements were signed in March 2003: (i) An Operational Agreement between UNESCO and the Government of the Netherlands; (ii) A Cooperation Agreement between UNESCO and the IHE Delft Foundation; and (iii) A Seat Agreement between UNESCO and the Kingdom of the Netherlands.

[56] According to a recent quality assessment of research institutions in the Netherlands (SENSE), UNESCO-IHE was rated as 'world class' and 'very impressive'.

[57] UNESCO (2007). 34 C/47, Item 5.10 of the Agenda; p.2.

[58] It should be noted that at the time of the evaluation, there were ongoing discussions between GoN, UNESCO-IHE and UNESCO Headquarters on potential reforms of the governance framework.

[59] http://www.unesco.org/new/en/natural-sciences/environment/water/ihp/

operations by overseeing the finances and ensuring proper embedding of the Institute in the Dutch legal systems.

Academic Departments: UNESCO-IHE has three Academic Departments with academic staff responsible for education, training and research programmes. These are the Environmental Engineering and Water Technology, Water Science and Engineering, and Integrated Water Systems and Governance departments. Each Academic Department is composed of Chair Groups, each of which is formed around a particular discipline or specialization.

Process Management Units: The work of the Academic Departments is supported by the Institute's Process Management Units. These include Central Services, the Education Bureau, Finance, Human Resource Management, IT, and the Office of the Rector.

Source: *UNESCO-IHE Annual Report 2014*; pp.7-8.

1.2 UNESCO-IHE: funding

From a UNESCO standpoint, UNESCO-IHE entirely relies on extra-budgetary funds (Table 1). The base subsidy provided by the Dutch Ministry of Education, Culture and Science (OCW) to the Institute on an annual basis between 2011 and 2015 (Table 1) represents the largest contribution to the Institute's core funding (on average **€**10,6 million per year). The rest of the Institute's funding consists of tuition fees paid by students enrolled in the Institute's academic programmes as well as of project-based revenues[60]. The renewal of the OCW funding is subject to the performance requirements spelled out in the multi-year Operational Agreement signed between OCW and UNESCO.

Table 1: UNESCO-IHE Sources of Gross Income in 2011-2014 (mln €)

	2011	2012	2013	2014	2015
OCW Grant	10,9	10,7	10,7	10,2	10,4
Tuition Fees	8,7	12,3	14,0	15,8	14,7
Projects	9,9	10,8	10,9	13,0	13,0
Other	3,0	1,7	0,5	0,5	1,5

Source: *UNESCO-IHE Strategy 2015-2020* (2015); p.56. *UNESCO-IHE data.*

1.3 Mission statement and objectives of UNESCO-IHE

According to the Statutes approved during the 31st session of the UNESCO General Conference in October 2001 (hereinafter referred to as UNESCO-IHE Founding Document), UNESCO-IHE had a twofold mission and seven key objectives (Table 2).

Table 2: UNESCO-IHE Original Mission and Objectives

1. Within UNESCO's educational and scientific mandate, the mission of the Institute shall:

- Strengthen and mobilize the global educational and knowledge base for integrated water management;
- Contribute to meeting the water-related capacity-building needs of the developing countries and countries in transition.

2. To that end the Institute shall focus on the following objectives:

- To serve as a standard-setting body for postgraduate water education programmes and continuing professional training, building on the experience of the IHE and UNESCO' s International Hydrological Programme and any other relevant experience;
- To develop and deliver state-of-the-art education and research programmes, including postgraduate programmes and continuing professional training, making use of split-site programmes and distance learning, in all aspects of integrated water management to young, mid-career and senior professionals and decision- makers working with or within developing countries and countries in transition;
- To create and reinforce networks of water sector educational institutions, and to act as an international forum for experts and professionals to exchange scientific, educational and technical information and knowledge in all aspects of integrated water management by strengthening the capacities of its partners, such as regional educational and water sector institutions and organizations, with equal and complementary skills that can add to the overall knowledge base of the network and forums;

[60] As per the DGIS - UNESCO-IHE Programmatic Cooperation (DUPC), the Government of the Netherlands (Ministry of Foreign Affairs) provided an additional grant of **€**25 million between 2008 and 2014 (DUPC Annual Report 2014, p. 1).

• To contribute through research and education to the regular assessment of water availability and use worldwide and to facilitate the exchange of information and knowledge on water availability and use; • To assist in studying educational problems in the field of integrated water management which emerge from programmes of assistance to developing countries; • To assist international organizations, and global initiatives in the coordination and execution of the respective water-related programmes; • To initiate and facilitate international policy dialogues on scientific and technical grounds on issues concerning water management.

Source: *31 C/47*.

A decade later, UNESCO-IHE's mission and objectives seem broader, as attested by its different medium-and long-term strategies. The *Strategic Directions UNESCO-IHE in 2020*, which was approved in 2011, envisaged the establishment of regional UNESCO-IHE institutes and the granting to the Institute of its own PhD granting rights. More recently, the new UNESCO-IHE strategy approved by the GB (*Strategic Directions UNESCO-IHE 2025*) put forward a threefold mission (i) to contribute to the education and training of professionals; (ii) to expand the knowledge base through research; and (iii) to build the capacity of sector organizations, knowledge centres and other institutions active in the fields of water, the environment and infrastructure in developing countries and countries in transition[61] (Table 3).

Table 3. UNESCO-IHE New Overall and Strategic Objectives (as of 2015)

Overall Objective 1: Maintaining and improving quality
Specific Objective 1. Maintain, or where needed, strengthen the quality of research, education and capacity development
Specific Objective 2. Focus activities, find synergies, e.g. in better linking education, research and capacity development
Overall Objective 2: Expanding global presence and achieving stronger societal impact
Specific Objective 3. Create more value from and strengthen, where needed, our partnerships for impact on the ground
Specific Objective 4. More effectively translate new technologies, developments and insights to address local needs
Objective 5. Better monitor and communicate our impact in education, research and capacity development
Overall Objective 3: Enhancing institutional resilience
Specific Objective 6. Become financially resilient in a changing economic and political climate
Specific Objective 7. Develop a transparent, open corporate culture, increased compliance with internal policies, laws and regulations
Specific Objective 8: Improve staff satisfaction and cohesion within the Institute

Source: Adapted from *UNESCO-IHE Strategy 2015-2020* (2015); pp.18-20.

It is worthwhile to note that in recent years UNESCO-IHE has also made efforts to enhance its influence on policy debates on water security and governance, mainly through projects in developing and transition countries and research evidence. One important channel for achieving this purpose has been its alumni network (many of its alumni[62] are now in top positions in developing countries).

Finally, the work of UNESCO-IHE revolves around 5 core values (Table 4).

[61] The Institute's vision is 'a world in which people manage their water and environmental resources in a sustainable manner, and in which all sectors of society, particularly the poor, can enjoy the benefits of basic services'.

[62] According to the recent findings of an Alumni Tracer survey, 98% of the Institutes' MSc graduates go back to their own countries and 80% of them are still in the water profession 20 years after graduation.

Table 4. UNESCO-IHE 5 Core Values

Relevance & impact
Continue, in everything we do, to respond to societal need and to have impact on the water related problems in developing countries and countries in transition.
Academic status
Retain our current academic status and academic freedom, which benefits staff, fellows and students alike.
Unique position
Conserve our unique position as an international, multicultural, multidisciplinary institute, embedded in the Dutch water sector.
Functional autonomy
Maintain our autonomy and flexibility in relation to governance, financing, decision-making and security of staff tenure.
Transparent governance
Ensure all governance and decision-making is open, transparent and that staff are consulted and heard without risk of negative consequences.
Source: *UNESCO-IHE Strategy 2015-2020*

1.4 Alignment with UNESCO's Mandate in the framework of the 'UNESCO Water Family'

The evaluation covers a time period that corresponds to several UNESCO programming periods, specifically, 35 C/5 (2010-2011), 36 C/5 (2012-2013) and 37 C/5 (2014-2017). Specific references to UNESCO-IHE can be found in the UNESCO C/5 biennial[63] programme documents.

In the 37 C/5 UNESCO-IHE is covered under UNESCO Major Programme II (Natural Sciences) and its work is aligned with the Programme II Expected Results 12 and 13 under Main Line of Action (MLA) 6 ('Strengthening freshwater security'). UNESCO-IHE's work is aligned with that conducted by all other members of the 'UNESCO Water Family': the IHP Secretariat, the IHP Committees, the Category II Institutes, WWAP (World Water Assessment Programme) and the Water-related UNESCO Chairs and UNITWIN Networks[64]. First, the Institute contributes to all the themes of the IHP's current strategic plan entitled 'Water Security: Responses to Local Regional and Global Challenges' (IHP-VIII for 2014-2021). Second, the Institute conducts research on topics central to the IHP, including water-related disasters in a changing environment, ecohydrology, climate change adaptation, urban water management, transboundary groundwater, and water governance. Finally, UNESCO-IHE collaborates with WWAP by contributing to the analysis and co-authoring of chapters with other partners, such as IHP, in the annual World Water Development Report.

UNESCO-IHE's work is also aligned to the priorities of the Dutch government in this area[65], and part of UNESCO's commitment to contribute to the implementation of the UN 2030 agenda and, more specifically, of SDG 6 ('Ensure availability and sustainable management of water and sanitation for all')[66].

1.5 Programmatic activities and outputs of UNESCO-IHE

The Institute operates in three strategic areas of intervention - education, research and capacity development – and is currently involved in the implementation of projects in over 40 countries.

Education: UNESCO-IHE is currently offering four Master's degree programmes (Water management, Urban water and sanitation, Water science and engineering and Environmental Science) with a total of 21 specializations, a Ph.D. programme, as well as online specialized

[63] From the 37 C/5 onwards, UNESCO operates on the basis of a quadrennial programming cycle.
[64] UNESCO-IHE Annual Report 2014, pp.10-11.
[65] UNESCO-IHE is a member of the Netherlands Water Partnership and part of the Technological Innovation Campus Delft. Through the support of the DGIS–UNESCO-IHE Programmatic Cooperation (DUPC), the Institute also contributes to the Dutch development cooperation and trade agenda and ambitions of the Ministry of Foreign Affairs.
[66] http://www.unwater.org/sdgs/from-mdgs-to-sdgs/en/

courses and professional diploma online modules. The Institute enrols an average of 230 MSc students per year and over 300 professionals in short courses. In addition to that, the Institute is responsible for the delivery of joint programmes with a number of other partners[67].

Research: UNESCO-IHE staff conduct research in six main areas: 1) Safe drinking water and sanitation; 2) Water-related hazards and climate change; 3) Water and ecosystems quality; 4) Water management and governance; 5) Water, food and energy security, and; 6) Information and knowledge systems. The number of Ph.D. fellows conducting research at the Institute has grown from 90 in 2009 to 130 in 2012[68]. Likewise, the number of peer-reviewed publications has almost doubled from 267 in 2008 to 511 in 2012[69].

Capacity Development: The Institute is engaged in a number of activities, networks and umbrella organizations that aim to enhance the institutional development of agencies and entities responsible for the management of water-related services and programmes (e.g. World Water Forums, IWA, PPP forums). More specifically, the Institute's activities in capacity development are wide ranging, from the provision of tailored trainings to a critical mass of water authorities' officials to the supply of policy advice to Ministries of Environment around the world[70].

Two specific projects in this area recently attracted international attention. On the one hand, the programmatic cooperation with the Asian Development Bank (ADB)[71] (the first phase received a USD 2.5 million support and the second phase received approximately USD 2.4 million) consisting in the Institute managing 19 water operations in ADB's Developing Member Countries. On the other hand, the BMGF-funded project called 'Sani-UP: Stimulating Local Innovation on Sanitation for the Urban Poor in Sub-Saharan Africa and South-East Asia' (USD 11.0 million), the largest research and capacity- building project for pro-poor sanitation ever conducted which includes, among others, a total of 5 post-doc researchers, 20 PhD fellows, 60 MSc students, 500 online course participants and 130 man-years of research[72].

1.6 Rationale for the evaluation

The evaluation responds to the official request for a statutory evaluation of UNESCO-IHE activities, jointly commissioned by UNESCO and the Government of the Netherlands, and to be completed by 1 July 2016 (Article 1.2 of the Operational Agreement between UNESCO and OCW; 38 C/Resolution 20 adopted by the UNESCO General Conference in November 2015)[73]. More specifically, during the negotiations leading to the renewal of the Operational Agreement between OCW and UNESCO for the 2014-2018 period, it was established that the Dutch funding of the Institute for 2017 and 2018 would be subject to an evaluation of the Institute's performance in education, research and valorisation of knowledge in assisting developing countries and countries in transition (UNESCO-IHE Annual Report 2014, p. 12; Article 1.2 and article 5 of the Operational Agreement between UNESCO and OCW).

2. Purpose and scope

2.1 Purpose

The purpose of the evaluation will be primarily summative. The evaluation will assess UNESCO-IHE's performance in education, research and valorisation of knowledge in assisting developing countries and countries in transition for the period 2010-2015.

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[67] These include Dutch Universities (e.g. Wageningen University and Delft Institute of Technology) and academic institutions outside of Europe (e.g. Universidad del Valle in Colombia, Oregon State University in the US, Egerton University in Kenya, Kwame Nkrumah University in Ghana, and the University of Peace in Costa Rica).
[68] UNESCO-IHE Annual Reports 2009 and 2012.
[69] *ibid*.
[70] *ibid*.
[71] UNESCO-IHE Annual Report 2013, p. 29.
[72] UNESCO-IHE Annual Report 2013, p. 30.
[73] The Resolution requested the Director-General to submit to the Executive Board, at its 200th session, a new proposed version of the Operational Agreement between UNESCO and the Government of the Netherlands (and, if necessary, a revised version of the Statutes of UNESCO-IHE and a new proposed version of the Cooperation Agreement) pending the completion of an evaluation to be implemented in early 2016 and the demonstration of the Institute's positive outcome and a positive outcome of the negotiations between UNESCO, the Dutch Government and the IHE Delft Foundation.

The evaluation will also have two formative purposes. On the one hand, the evaluation findings are expected to provide UNESCO with further guidance on how to position UNESCO-IHE within the UNESCO mid-term strategy 2014-2021, the 'UNESCO Water Family', the Dutch Water Sector and the international water community. On the other hand, the desk study and the data analysis conducted during the evaluation will provide the basis for the development of a monitoring and evaluation framework that will assist UNESCO-IHE to better measure and report the outcomes and impact of its activities.

2.2 Scope

The evaluation will focus on four main dimensions of performance:

Relevance: the alignment of UNESCO-IHE's research, education and capacity development activities with: (i) the UNESCO mid-term strategy 2014-2021; (ii) the mission and objectives of UNESCO-IHE as indicated in its founding document; (iii) UNESCO-IHE's Strategy 2015-2020; and (iv) the Sustainable Development Agenda 2030.

Effectiveness: UNESCO-IHE's results in terms of output delivery and outcome achievement in research, education and capacity development. This includes *inter alia* data collection and assessment of quality of research and education activities. Particular attention will be given to the academic and policy influence of its work, with a focus on developing countries and countries in transition.

Complementarity: UNESCO-IHE's (potential) comparative advantage within the 'UNESCO Water Family', the Dutch Water Sector and the international water community.

Coordination: the type and quality of UNESCO-IHE's partnerships and collaborations; in particular, its configuration within the 'UNESCO Water Family', the Dutch Water Sector and international water community.

For each of these dimensions the evaluation will provide action-oriented recommendations formulated on the basis of substantive findings.

2.3 Evaluation questions

The main questions of the evaluation will be further refined in the evaluation's data collection plan. Indicative questions are provided below:

2.3.1 Relevance

To what extent have UNESCO-IHE's main activities in each of the three key strategic areas (research, education and capacity development) been aligned to:

- UNESCO's priorities and policies (from the perspective of UNESCO's Mid-term Strategy 2014-2021, UNESCO IHP and the 'UNESCO Water Family')?
- the mission and goals indicated in UNESCO-IHE's founding document?
- UNESCO-IHE's Strategy 2015-2020?
- -he Sustainable Development Agenda 2030?

2.3.2 Effectiveness

What have been the main outputs and outcomes of UNESCO-IHE's work?

What has been the quality of UNESCO-IHE's education and research activities[74]?

To what extent have UNESCO-IHE's outputs and outcomes contributed to the achievement of the Institute's strategic objectives?

What are the factors that have enabled or hindered the achievement of the Institute's strategic objectives?

2.3.3 Complementarity

What has been the comparative advantage of UNESCO-IHE's main activities, if compared with those carried out by the IHP Secretariat as well the other members of the 'UNESCO Water Family', and why?

What has been the comparative advantage of UNESCO-IHE's main activities, if compared with those carried out by other institutional actors in the Dutch Water Sector, and why?

[74] And what existing evidence (from accreditation reports, evaluations, bibliometric analyses, etc.) is available to support the evaluation's findings on this issue?

What has been the comparative advantage of UNESCO-IHE's main activities, if compared with similar academic institutions and research/training centres around the world, and why?

2.3.4 Coordination

What are UNESCO-IHE's main institutional partners?

How are the activities of UNESCO-IHE articulated with other UNESCO entities (e.g. IHP Secretariat, IHP Committees, WWAP, Category 2 Centres, Water-related UNESCO Chairs)?

How are the activities of UNESCO-IHE articulated with those of other key actors operating in the Dutch Water Sector and the international water community?

What are the main challenges and opportunities associated with UNESCO-IHE's coordination with its main partners within UNESCO, the Dutch Water Sector and other institutions in the international water community?

What has been the role of UNESCO-IHE in national, regional and global water fora and networks?

2.4 Potential uses of the evaluation

The findings and recommendations of the evaluation, among other things, will:

Provide evidence to UNESCO and OCW about UNESCO-IHE's performance to inform: (i) the process of renewal and revision of the agreement(s) between UNESCO and GoN on UNESCO-IHE; and (ii) the allocation of funding by OCW;

Provide evidence to UNESCO-IHE, including its GB, on the Institute's key achievements, challenges and ways forward; and

Provide evidence to the UNESCO Natural Sciences Sector, IHP Secretariat, IHP-IGC, on UNESCO-IHE's role within the UNESCO-Water Family.

The main users of the evaluation are UNESCO and OCW. More specifically, users include the following: UNESCO-IHE staff and GB, OCW, IHP Secretariat, IHP-IGC, UNESCO's Executive Board and Director-General, the Dutch Ministry of Foreign affairs and Ministry of Infrastructure and Environment, the other members of the 'UNESCO Water Family' and finally, the wider policy and academic community in the field of water.

3. Methodology

The evaluation will include the following methodological elements (tasks):

Desk study of key documents (from UNESCO-IHE, IHP, and others) that provide insights into the evaluation questions. Of particular relevance are also prior reviews, evaluations and performance assessments, such as (e.g.) the UNESCO-IHE Draft Mid-Term Review 2008-2010, the IHP Evaluation Phase VII (2008-2013), the 2013 External evaluation of the DGIS UNESCO-IHE Programmatic Cooperation (DUPC) and the 2013 Review of the UNESCO-IHE Institute for Water Education (IOS/EVS/PI/130).

Development of a working Theory of Change of UNESCO-IHE[75], articulating its main areas of work to key outputs and expected outcomes as well the major assumptions underlying these linkages.

Semi-structured interviews with key stakeholders (face to face/phone/Skype) with the following stakeholders: UNESCO staff (ADG Science, IHP Secretariat staff; UNESCO-IHE staff), GB Chair, FB Chair, Dutch Government representatives (OCW, Netherlands Delegation at UNESCO, the Dutch Ministry of Foreign Affairs and Ministry of Infrastructure and Environment), UN-Water Members, institutional partners of UNESCO-IHE, relevant leading researchers (including Directors of institutes and research centres similar to UNESCO-IHE), decision makers in the field of Water within and outside of the Netherlands, UNESCO-IHE students and alumni.

[75] The concept of Theory of Change, stemming from evaluation theory, is used to articulate the main relationships between the main types of activities, outputs and outcomes of the institution. There is no such thing as 'the' Theory of Change. The evaluation will develop a working theory to be used as a guiding principle in the evaluation. This working theory will be further discussed and refined in the workshop on outcome and impact assessment to be organized in June in collaboration with UNESCO-IHE.

Policy and academic influence analysis: on the basis of semi-structured interviews (phone/Skype; purposive sample of decision makers around the world), an online survey, bibliometric analysis of major academic databases (e.g. Web of Science, EBSCO, Google Scholar), as well as additional analyses of visibility and use of UNESCO-IHE products including (e.g.) the 'Hootsuite' system for trends measurements among social media followers; and 'Google Analytics' for web statistics measurements. As much as possible, the evaluation will build on existing data and assessments of research and education quality as well as evaluations of capacity development projects.

The evaluation will include two missions to UNESCO-IHE in Delft (including meetings in The Hague) and one short mission to Geneva.

An initial list of documentation is included below. At the start of the data collection process, UNESCO-IHE and the IHP Secretariat will provide comprehensive documentation about the Institute to the external evaluator.

4. Roles and responsibilities

The evaluation will be managed by UNESCO's Internal Oversight Service (IOS) and conducted by an external evaluator.

IOS will have a management and quality assurance role of the evaluation process. In addition, IOS will participate in some of the data collection, analysis and reporting activities. The division of labour in data collection, analysis and reporting is presented below (Table 3). The precise division of labour will be determined during the finalization of the data collection plan.

Table 3. Division of evaluation tasks and responsibilities

Activity or Output	Division of labour	Responsible for delivery
UNESCO-IHE Theory of Change	External evaluator	External evaluator
Data Collection Plan	External evaluator	External evaluator
Interviews with key stakeholders	External evaluator	External evaluator
Survey	External evaluator	External evaluator
Bibliometric analysis	External evaluator	External evaluator
Draft evaluation report	External evaluator with inputs from IOS	External evaluator (with final quality assurance by IOS)
Final evaluation report	External evaluator with inputs from IOS	External evaluator (with final quality assurance by IOS)
Workshop on outcome and impact assessment	External evaluator with inputs from IOS	External evaluator with inputs from IOS

UNESCO-IHE and the IHP Secretariat will assist in the preparation and organization of the evaluation exercise and will facilitate the activities of the external evaluator (including logistical support in Delft).

A Reference Group will be established to guide the evaluation. The Reference Group will consist of representatives from each of the following entities: IOS, IHP, UNESCO-IHE (including representatives from the GB and FB), and GoN (OCW). The Reference Group will comment on the Terms of Reference and the draft evaluation report and can provide guidance (unrequested or upon request) throughout the evaluation process. IOS will convene the Reference Group and manage the correspondence throughout the evaluation process.

5. Schedule and deliverables

The evaluation will have four main deliverables: a data collection plan (including a working Theory of Change, the related evaluation matrix, the proposal for an analysis of the Institute's outcomes), a draft evaluation report, a final evaluation report, and a workshop on outcome and impact assessment (Table

4). These deliverables are the responsibility of the external evaluator (with inputs from IOS, see above). The following guidelines apply:

The data collection plan (max. 12 pages excluding annexes) will include: refined evaluation questions, a concise description of a working Theory of Change, the methodological framework for the evaluation, and a detailed activity schedule. The data collection plan will include a simple evaluation matrix that shows the relationships between the main evaluation questions and the methods of data collection and analysis.

The final evaluation report (of max. 60 pages excluding annexes) will present in a concise manner the following elements:

- Executive Summary (maximum 4 pages)
- Evaluation purpose and scope
- Methodology
- Working Theory of Change and description of the Institute's work and objectives
- Findings[76]
- Recommendations
- Annexes

Table 4. Tentative schedule (to be finalized in the data collection plan)

Tasks	Responsible for delivery	Deadline
Establishment of the Reference Group	IOS	March 4, 2016
Finalization of draft ToR	IOS	March 20, 2014
Data collection plan	External evaluator	March 25, 2016
Data collection phase	External evaluator and IOS	March 28, 2016
Draft evaluation report	External evaluator	May 31, 2016
Final evaluation report (after feedback and comments)	External evaluator	May 25, 2016
Workshop on outcome and impact assessment	External evaluator	June 28, 2016

6. Qualifications of the external evaluator

The external evaluator selected by IOS will possess the following qualifications:

- Mandatory qualifications:
- At least 10 years of professional experience in evaluation in the field of international development.
- Experience in the evaluation of policy-oriented research programmes.
- Experience in the evaluation of capacity development programmes.
- Knowledge of international research and education programmes as well as debates on water and sustainable development.
- Knowledge of the UN system and other international organizations.
- Fluency in English (written and spoken).

Desirable qualifications:

- Knowledge of the role and mandate of UN-Water.
- Knowledge of the role and mandate of UNESCO and its programmes.
- Knowledge of gender perspectives in evaluation.

[76] This will include a section on Programmatic achievements in Education, Research and Capacity Development.

ANNEX 2: EVALUATION QUESTIONS

1. Relevance

- To what extent have UNESCO-IHE's main activities in each of the three key strategic areas (research, education and capacity development) been aligned with?
- UNESCO's priorities and policies (from the perspective of UNESCO's Mid-term Strategy 2014-2021, UNESCO IHP and the 'UNESCO Water Family')?
- The mission and goals indicated in UNESCO-IHE's Founding Document?
- UNESCO-IHE's Strategy 2015-2020?
- The Sustainable Development Agenda 2030?

2. Effectiveness

- What have been the main outputs and outcomes of UNESCO-IHE's work (in the three areas of education, research and capacity development)?
- What has been the quality of UNESCO-IHE's education and research activities[77]?
- To what extent have UNESCO-IHE's outputs and outcomes contributed to the achievement of the Institute's strategic objectives?
- What are the factors that have enabled or hindered the achievement of the Institute's strategic objectives?

3. Complementarity

- What has been the comparative advantage of UNESCO-IHE's main activities, if compared with those carried out by the IHP Secretariat as well the other members of the 'UNESCO Water Family', and why?
- What has been the comparative advantage of UNESCO-IHE's main activities, if compared with those carried out by other institutional actors in the Dutch Water Sector, and why?
- What has been the comparative advantage of UNESCO-IHE's main activities, if compared with similar academic institutions and research/training centers around the world, and why?

4. Coordination

- What are UNESCO-IHE's main institutional partners?
- How are the activities of UNESCO-IHE articulated with those of other UNESCO entities (e.g. IHP Secretariat, IHP National Committees, WWAP, Category 2 Centres, Water-related UNESCO Chairs)?
- How are the activities of UNESCO-IHE articulated with those of other key actors operating in the Dutch Water Sector and the international water community?
- What are the main challenges and opportunities associated with UNESCO-IHE's coordination with its main partners within UNESCO, the Dutch Water Sector and other institutions in the international water community?
- What has been the role of UNESCO-IHE in national, regional and global water fora and networks?

[77] And what existing evidence (from accreditation reports, evaluations, bibliometric analyses, etc.) is available to support the evaluation's findings on this issue?

ANNEX 3. LIST OF STAKEHOLDERS (INTERVIEWS)

UNESCO-IHE Staff

Name	Title	Division/ Office
Mr. Fritz Holzwarth	Rector ad interim	Office of the Rector
Mr. Edmond Wellenstein	Adviser	Foundation Board/Office of the Rector
Ms. Iwona Wagner	Chair	Governing Board
Mr. Johan A. van Dijk	Director	Business Unit
Mr. Dirk van der Berg	Business Director	
Mr. Robert de Bruijn	Manager	Finance Department
Mr. Ben Stuijfzand	Senior Project Controller	Finance Department
Mr. Gaetano Casale	Manager	Liaison Office
Ms. Vanessa de Oliveira	Liaison Officer	Office of the Rector
Ms. Mishka Stuip	Liaison Officer	Office of the Rector
Ms. Ruth Webber	Manager	Communication Unit
Ms. Uta Wehn de Montalvo	Associate Professor	Capacity Development and Innovation
Mr. Dimitri Solomatine	Head	Integrated Water Systems and Governance department.
Ms. Charlotte de Fraiture	Head	Water Science and Engineering Department
Mr. Michael McClain	Professor	Coordinator of the Research Task Force
Mr. Damir Brdjanovic	Head	Environmental Engineering and Water Technology Department
Mr. Pieter van der Zaag	Professor	Integrated Water Resources Management Department
Mr. Jan Herman Koster	Senior Advisor	Education Development and International and Cooperation
Mr. Wim Douven	Coordinator	UNESCO-IHE Dutch Cooperation Program

UNESCO-IHE Students

Name	Title
Mr. Emanuele Fantini	Post-Doc
Mr. Laurens Welles	Post-Doc
Mr. Alexander José Kaune Schmidt	Ph.D. Student
Almotasembellah Abushaban	Ph.D. Student
Ms. Christiana Metzger Netto	Ph.D. Student
Mr. Joel Anyang	Ph.D. Student
Mr.Musaed Aklan	Ph.D. Student
Ms. Nirajan Dhakal	Ph.D. Student
Shakeel Hayat	Ph.D. Student
Shahnoor Hasan	Ph.D. Student
Mr. Iosif Skoullos	Ph.D. Student
Mr. Samuel Chidiebere Nnebu	MSc Student
Mr. Santhosh Garakahalli Siddaiah	MSc Student
Saurabh Gupto	MSc Student
Mr. David Stephan Otieno Omol	MSc Student

UNESCO Secretariat Staff

Name	Title	Division/ Office
Ms. Flavia Schlegel	Associate Director General	Science Sector
Ms. Blanca Jimenez-Cisneros	Director	Division of Water Sciences/SC/HYD
Mr. Stefan Uhlenbrook	Director	WWAP
Ms. Alice Aureli	Chief of Section	Division of Water Sciences/SC/HYD
Mr. Giuseppe Arduino	Programme Specialist	Division of Water Sciences/SC/HYD
Mr. Anathea Brooks	Programme Specialist	Executive Office

Mr. Engin Konkagul	Programme Specialist	Division of Water Sciences/SC/HYD
Mr. Miguel Doria	Programme Specialist	Montevideo Office
Mr. Alexander Otte	Consultant	
Mr. Youssef Filali-Meknassi	Programme Specialist	Division of Water Sciences/SC/HYD
Mr. Hiranand Purkait	Principal Auditor	Internal Oversight Office

Dutch Government

Name	Title	Division/ Office
Ms. Melissa Keizer	Senior Policy Officer of Internationalization	Ministry of Education, Culture and Science
Mr. Aart van der Horst	Senior Policy Adviser	Ministry of Foreign Affairs
Mr. Gerard de Vries	Manager of the Sino-Dutch Cooperation	Ministry of Infrastructure and Environment
Mr. Niels Vlaanderen	Coordinator International Water Affairs	Ministry of Infrastructure and Environment
Mr. Lionel Veer	Ambassador	Dutch Delegation to UNESCO

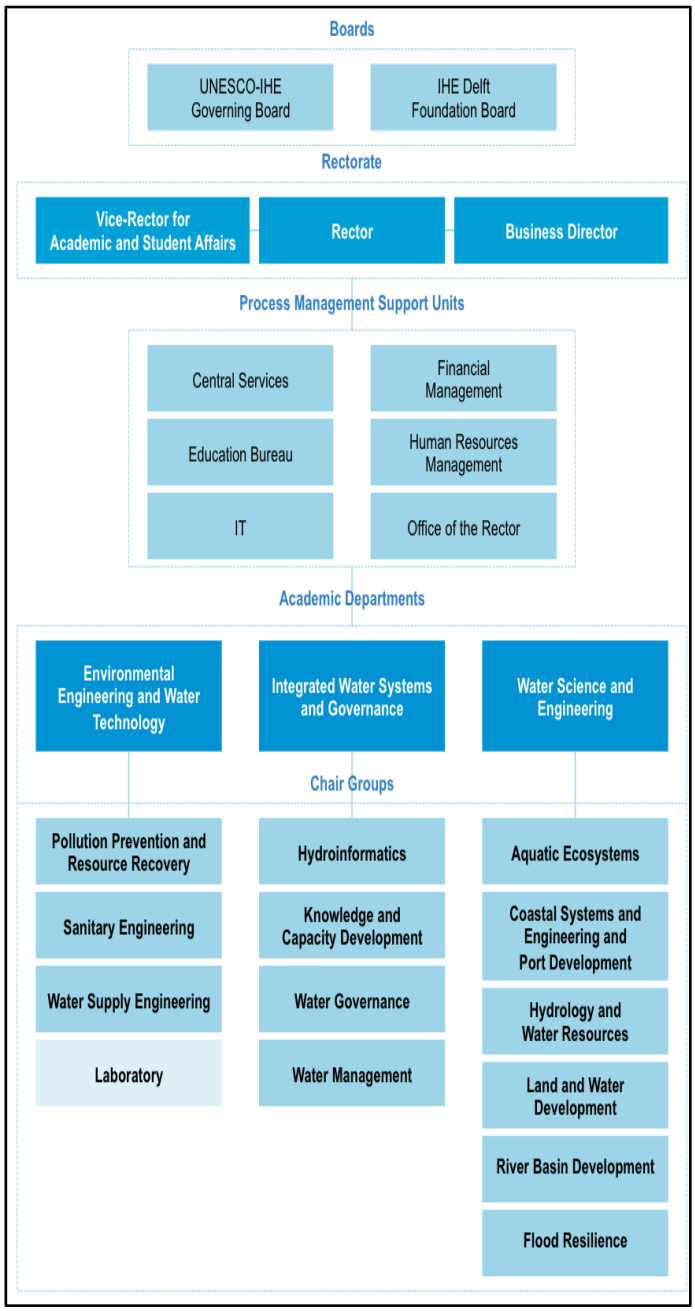
Experts and Partners

Name	Title	Division/ Office
Andras Szollosi-Nagy	Former Rector	UNESCO-IHE
	Former Director	Division of Water Sciences/SC/HYD
Mr. Wim Van Vierssen	Former Rector	UNESCO-IHE
Mr. Richard Meganck	Former Rector	UNESCO-IHE
Mr. Jose Alberto Tejada-Guibert	Former Director	UNESCO Division of Water Sciences/SC/HYD
Mr. Claudio Caponi	Senior Scientific Officer	Climate and Water Department/World Meteorological Organization
Mr. Yinka Adebayo	Director	Education and Fellowship Division/ World Meteorological Organization
Mr. Federico Properzi	Chief Technical Adviser	UN-Water

ANNEX 3: CHANGES IN UNESCO-IHE ORGANIZATIONAL STRUCTURE (BEFORE AND AFTER 2014)

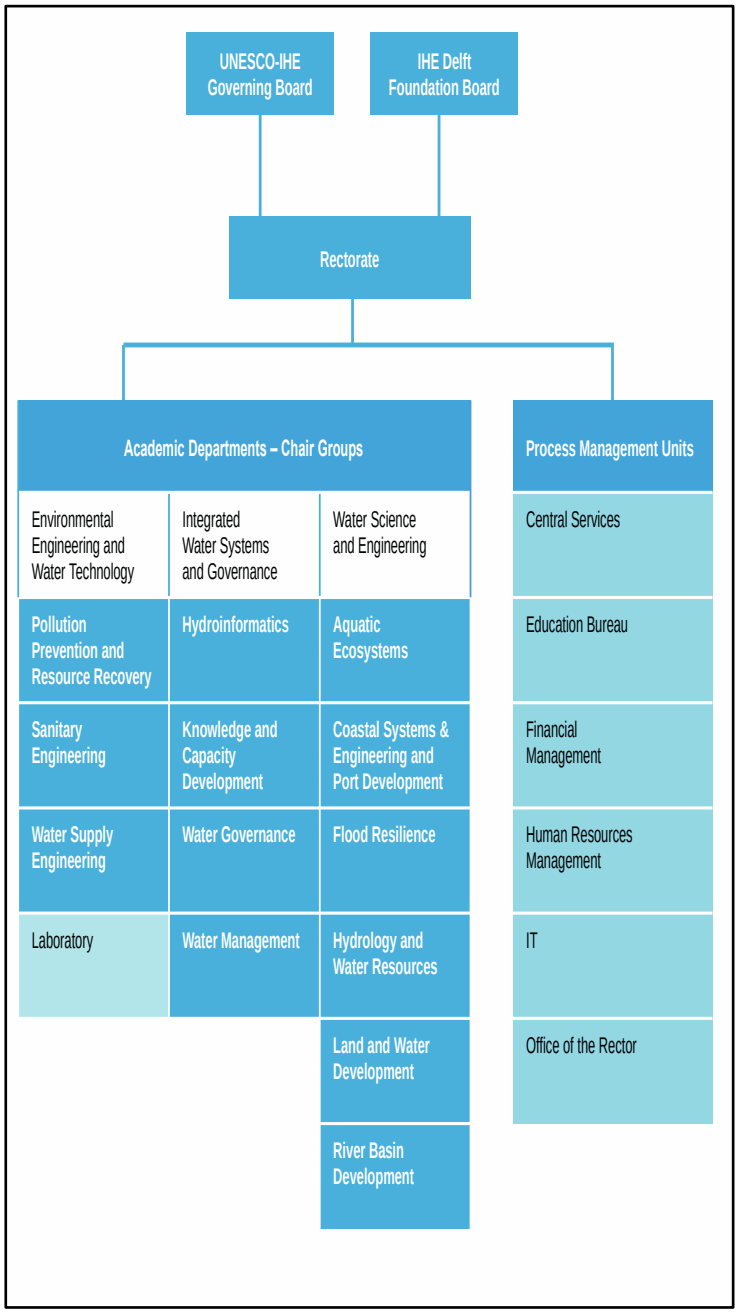
Source: UNESCO-IHE 2013b

UNESCO-IHE Organizational Chart



Source: UNESCO-IHE 2014

UNESCO-IHE Organizational Chart



ANNEX 4: UNESCO-IHE RELEVANCE TO UNESCO WATER FAMILY					
UNESCO **UNESCO-IHE Areas of work**	**UNESCO** **Science Sector**	**IHP**	**WAAP**	**Water Centres and Institutes**	**Water Chairs**
Education	**Strategic Objective 5** **(par. 51, p. 22)** • UNESCO will contribute to shaping the research agenda of global and regional scientific cooperation, based on the Rio+20 outcome document *"The Future We Want" and the post- 2015 development agenda.* **Strategic Objective 5 (par. 57, p. 22)** • UNESCO will promote international collaboration on the assessment and monitoring of global changes and natural hazards, including droughts and floods and geo-hazards, as well as tsunamis; the generation and sharing of scientific knowledge leading to the understanding of natural hazards; the reduction of disaster risks through supporting the establishment of early warning systems and coping mechanisms for potential disasters through education, the sciences and the promotion of social resilience.	**IHP Strategy VIII** **(Focal Area 3.3; p. 30)** • Empower education, universities and research institutes to address issues of water scarcity, including efficient water use and conservation. **IHP Strategy VIII** **(Focal Area 6.1; p. 43)** ○ Support the enhancement of tertiary water education capacities, particularly in developing countries. ○ Promote and assist the development of interdisciplinary and multidisciplinary curricula and research initiatives linked to water-related programs in higher education and research institutions. ○ Promote and support strategies and actions for continuous professional development of water scientists, engineers, managers and policy makers in the water sector. ○ Develop interdisciplinary materials, such as guidelines, briefing papers, prototype professional development	**WAAP education-related objectives** (UNESCO Website): • Raise awareness on current and imminent/future water related challenges to influence the global water agenda; • Promote gender equality	**IHP Strategy for Cat. 2 Institutes (p. 5)** • The following modes of collaboration and networking among UNESCO-IHE and UNESCO's water-related centres under the auspices of UNESCO are foreseen, in order to ensure that these centres function as a network within UNESCO's water family: b) share work plans with all water-related institutes and centres, harmonizing with the IHP plans; c) coordinate closely with other centres working on the same or on complementary issues/topics; d) exchange information on activities such as training/educational materials, and funding opportunities;	**IHP Strategy VII (2008-2013) p. 8** • UNESCO's Water-related Chair are established as teaching or research positions at universities or research institutes around the world.

		programmes and case studies connected with water education for water security, linked to the implementation of other themes and programmes of IHP. **IHP Strategy VII** **(Focal Area 6.5. p. 46)** • Assist in the development of curricula and research on trans-boundary water cooperation in higher education institutions.		e) exchange staff, most notably professionals and students, initiate joint activities, such as workshops, conferences, training programmes, joint projects, field visits, software and data sharing, knowledge exchange and publications; and g) hold regular meetings, for example, twice in the period of UNESCO's medium-term strategy, in order to plan, evaluate and review collaboration.	
Research	**Strategic Objective 5** • Promote international scientific cooperation on critical challenges to sustainable development **Global Priorities Section -Priority Africa Paragraph (par. 14, p. 15).** • The (Priority Africa) operational strategy clearly identifies areas of priority interest to Africa, obstacles and constraints to their implementation and levers for their alleviation, such as: (…) the building of knowledge societies to effect the transition to a knowledge economy driven decisively by scientific research, technology and innovation, knowledge production and application, access and fairly	**IHP Strategy VIII** ***(Focal Area 1.5; p. 23)*** • IHP VIII encourages the development of scientific and methodological basis for hydrology and water sciences to prepare and respond to extreme events. • Research in river flow formation processes, methods of hydrological calculations and forecasting, mathematical and numerical modeling and improvements to the theory of channel processes and sedimentation are among the research topics suggested by Member States. **IHP Strategy VIII** ***(Focal Area 2.4; p. 27)***	**WAAP research-related Objectives** (UNESCO Website): • Monitor freshwater issues in order to provide recommendations, • Develop case studies • Enhance assessment capacity at the national level and inform the decision-making process.		**IHP Strategy VII (2008-2013) p. 8 UNESCO's Water-related Chairs** are established as teaching or research positions at universities or research institutes around the world.

	shared knowledge; **Strategic Objective 6, (par. 64, p. 53)** • Promote fair access for all to scientific knowledge and developments, as well as integrity and responsibility in the research agenda will be promoted in order to support the emergence of scientifically informed, just and equitable societies.	• Additional research is needed in the modeling of hydro-geochemical processes and in the study of the chemical and isotopic evolution of groundwater. This focal area addresses groundwater quality management with the view to improving groundwater pollution prevention policy, mitigate pollution risk and enhance effective in situ pollution remediation techniques. **IHP Strategy VIII** **(Focal area 3.5. p. 32)** • Promote joint research on particular water quality issues and challenges through improving the understanding and scientific knowledge on new and emerging pollutants, and monitoring/risk assessment, regulations, control/attenuation. **IHP Strategy VIII** **(Focal 5.1. p.38)** • HP will support research and capacity building initiatives aimed to improve the understanding of the inter-linkages of ecohydrological processes at the catchment scale with special emphasis on implementation at UNESCO IHE demonstration sites.			
Capacity Development	**Strategic Objective 5 (par.53, p.22)** • UNESCO will continue to build institutional and human capacities of Member States in the various fields of freshwater resources	**IHP Strategy VIII** **(Focal Area 3.3, p.31)** Promote tools for stakeholders involvement and awareness and conflict resolution			

	management. The Organization will make available updated knowledge for policy guidance on freshwater resources. **Strategic Objective 6 (p.59, p.23)** • Strengthen the links between research, practice and policy-making. • Support Member States in developing and implementing policies to accompany social transformations, in particular through human and institutional capacity-building.	**IHP Strategy VIII** **(*Focal Area 3.4; p. 31)*** Promote and support capacity development for decision makers in managing conflicts over water resources use under scarcity conditions induced by either human activities and/or climatic change. [...] This focal area also aims at enhancing legal, policy and institutional frameworks for water quality management and building institutional and human capacity in water quality management and water pollution control. **IHP Strategy VIII** **(Focal area 4.4. p. 35)** Organize a series of well-designed events in target countries and sub-regions and [...] impart capacity building sessions – these would need to closely coordinated with the local authorities, regional organizations such AMCOW (African Ministers' Council on Water), ADB, AFDB, and UN organizations such as UN-Habitat. **IHP Strategy VIII** **(Focal area 4.5; p. 36)** Identify appropriate technology for agriculture, water and sanitation services that can be accepted, developed, operated and maintained by the local rural people, who often lack education/capacity and resources.			

ANNEX 5: A SAMPLE OF UNESCO-IHE RESEARCH PROJECTS

1.	Changing Waves and Coasts in the Pacific
2.	Preparing for Extreme and Rare Events in Coastal Regions
3.	Demonstrating integrated innovative technologies for an optimal and safe closed water cycle in Mediterranean tourist facilities
4.	Global Earth Observation for integrated water resource assessment
5.	A pilot conjunctive water supply system for Deyong City
6.	Sustainable freshwater supply in urbanizing Maputo
7.	Understanding Flows of Water and People in Bangladesh and the Netherlands
8.	ICT for Water Resource Efficiency
9.	AXA Endowed Visiting Chair programme in the field of Climate Change (CC) impacts and Coastal Risk
10.	PvW III Mobile Water Measure Mozambique
11.	Investing in Land and Water: turning climate finance mechanisms into tools for cooperation
12.	Ecohydrological multi-scale thermal monitoring and validation of water and energy fluxes in freshwater wetlands
13.	Atbara dams sedimentation and operation Study
14.	Rufiji Basin Environmental Flow Assessment
15.	Analysis of water accounts for major river basins located in DGIS water countries
16.	Dutch-Palestinian Academic Cooperation Programme in Water
17.	Monitoring saltwater intrusion to safeguard drinking water supply in Maputo, Mozambique
18.	Implementation of the Feasibility Study of the Comoe River in Grand Bassam
19.	Capacity development for sustainable use of natural resources in Lake Victoria Basin
20.	Development of bioprocesses for odour and VOC control from sewage treatment plant facilities undertaken by SANEPAR
21.	Delta Alliance Comparative Assessment 2.0
22.	Development of a Global Research and Innovation Agenda
23.	WU PhD Supervision by Margreet Zwarteveen
24.	Water Supply and Sanitation in Secondary Towns in Mozambique
25.	Ensemble flow forecasting research with visiting PhD student from HoHai University
26.	Evaluation of the oxygen uptake rate (OUR) of an MBR-speece cone system operated at highly concentrated mixed liquor suspended solids (MLSS)
27.	PhD support for DSS on lake Taihu
28.	Crablock - Flume Investigation
29.	Africa to Asia and Back Again: Testing Adaptation in Flood-Based Farming Systems (Phase 2)
30.	Assessment of Climate Change driven variations on future longshore sediment transport rates along the coast of Vietnam
31.	Assessment of Climate Change driven variations in storm wave conditions in Vietnam
32.	Adding sediment transport and morphology in Delft 3D Flexible Mesh
33.	Potentials for Peace building: Examining linkages between WASH services and conflict in UNICEF Uganda programmes
34.	Water-Related Disaster Risk: towards a new research and capacity building programme at UNESCO-IHE
35.	LTV O&M Schelde Estuarium

36.	Delta Alliance 2.0 enhancing the knowledge network for deltas in the world
37.	Experienced Water Postdoc Fellowship Programme
38.	Experimenting with practical transition groundwater management strategies for the urban poor in Sub Saharan Africa
39.	Alternative approaches and tools for improved water supply sanitation for towns in Northern Uganda
40.	DEVELOPING, TESTING AND VALIDATION OF THE eSOS EMERGENCY SANITATION BUSINESS MODEL
41.	Advanced Biological Waste-to-Energy Technologies
42.	Performance Enhancement of Water Utilities in Kenya
43.	Capacity development and professional development in the Irrawaddy river basin
44.	Inclusive development paths for healthy Red River landscapes based on ecosystem services
45.	Mekong Modeling Phase 2
46.	Accounting for Nile waters: connecting investments in large scale irrigation to gendered reallocations of water and labor in the Eastern Nile basin
47.	Harnessing floods to enhance livelihoods and ecosystem services
48.	Managing Adaptive Responses to changing flood risk in Asia (MARE)
49.	A Holistic, Generic Modelling Approach To Simulate Catchment-Estuary-Coastal System Behaviour At Macro Time Scales
50.	Nile Ecosystems Valuation for wise-Use (Nile-Eco-VWU)
51.	Codifying water rights in contested basins of Afghanistan
52.	ADB TOP-UP Coastal Risk Sri Lanka - Pilot (CRISP)
53.	Subsurface Water Storage Pilot
54.	Myanmar Young Professionals Programme
55.	Translating Groundwater Policy to Practice in Jakarta, Indonesia
56.	Integration of the ensemble weather forecasting systems and hydrological models for uncertainty-based flow forecasts for Huaihe (Xiangyi Kong)
57.	Uncertainty and sensitivity analysis framework for flood forecasting: Case studies of the Wangjiaba catchment in the Huai River Basin (China) (Anqi WANG)
58.	Web-based decision support systems for Lake Taihu in China (YiChen)
59.	Surrogate modelling of Lake Taihu (Runze Shen)
60.	Optimization of the filling of the storage areas along Huahe river for flood protection (Zhe Sun)
61.	ADB TOP-UP Sri Lanka North coast sediment Transport (SLaNT) - Phase 1
62.	Hydroinformatics modelling, development and high performance
63.	San Francisco geomorphodynamics
64.	Africa Water Innovation Alliance
65.	Assessment of the Consequences and Sustainability of possible increases in water productivity by means of water accounting
66.	Excellence in Smart Data and Services for Water Management
67.	Maintenance and Improvement pilot system ensemble predictions Rijnland

ANNEX 6. UNESCO-IHE RESEARCH LINES (BY DEPARTMENT)

1. Integrated Water Systems and Governance Department	
Chair Group	**Research line**
Water Management	• Biophysical and social dimensions of water systems
	• Institutional and economic dimensions of water systems
	• Integrative instruments and interventions
Water Governance	• Water Politics Water Law Water Policy
Hydro-informatics	• Data, modelling, uncertainty and risk
	• Systems engineering, optimization and integration
	• Collaborative decision making and Internet-based computing and learning
Knowledge and Capacity Development	• Analysing the dynamics of professional knowledge dissemination and access to the global knowledge pool
	• Investigating the nature, extent and boundaries of citizen observatory contributions to improved knowledge flows and their implications for water governance
	• Assessing the economic and social value of knowledge and capacity development
	• Understanding the determinants for the effectiveness of knowledge and capacity development, and developing measuring metrics. The focus is, for the moment, on water supply utilities and Water Operator Partnerships
	• Analysing the dynamics of the learning, competence building and innovation systems for the water sector. Getting an operational grip on competence and skill building and organisational assessments, for the purpose of developing capacity development strategies
2. Water Science and Engineering Department	
Chair Group	**Research line**
Land Water Development	Water and food security
	Irrigation and ecosystems, in particular in wetlands and coastal lowlands
	Non-conventional irrigation options
	Modernization of irrigation and drainage systems
Aquatic Ecosystems	Nutrient and pollutant cycling Constructed wetlands
	Linking ecological processes with sustainable wetland use and livelihoods
Hydrology and Water Resources	Hydrological processes near the earth's surface
	Basin hydrology and global changes Ecohydrology
Coastal Systems, Engineering and Port Development	Integrated modeling of coastal processes and evolution
	Performance and reliability of breakwaters, coastal structures and flood defense systems
	Quantitative assessment of coastal risk
	Port development: traffic modelling, design of port master plans and expansion plans, adaptive port planning
	Port-related hydrodynamic and morphological modelling
River Basin Development	River processes in natural and man- made environments
	Optimal design of hydraulic structures
	Reservoir operation and management
Flood Resilience	Water Sensitive Cities
	Disaster risk reduction

3. Environmental Engineering and Water Technology Department	
Chair Group	**Research line**
Water Supply Engineering	Groundwater treatment
	Surface water treatment
	Desalination and water reuse
	Water transport & distribution
Pollution Prevention and Resource Recovery	Cleaner production and pollution prevention
	Solid waste management
	Resource recovery (water, nutrients, minerals, energy, new materials)
	Ecotechnologies (anaerobic digestion, natural treatment systems, photobioreactors)
Sanitary Engineering	Advanced nutrient removal processes
	Wastewater treatment processes development and modelling
	Use of seawater in sanitation
	Resources-oriented sanitation
	Sanitation provision to the urban poor
	Low-cost wastewater collection and treatment
	Anaerobic treatment of wastewater and sanitary slurries
	Faecal sludge management Emergency sanitation
	Hybrid systems for sewage treatment in developing countries
	Asset management of urban water infrastructure Flood and disaster risk management
	Model-based multi-objective optimization of urban water systems
	Public health impacts of Urban Water Systems

ANNEX 7. A SAMPLE OF TECHNOLOGICAL INNOVATIONS REALIZED BY UNESCO-IHE RESEARCH

eSOS concept	Water, Food & Energy Security Safe Drinking Water & Sanitation
Wastewater treatment for aquaculture	UNESCO-IHE focus areas
Arsenic removal family filter IHE-Adart	Water Management & Governance Water & Ecosystems Quality
Monitoring algal bloom in desalination plants	Water value maps
Fluoride removal family filter	Alternative flow regime benefit assessment
Seawater for toilet flushing and SANI®	eSOS smart toilet
Extreme events and UNESCO heritage sites	Monitoring Water Operator Partnerships
Centralised arsenic removal IHE-Adart	Benchmarking water and sanitation services
Quick-wins for flood protection of critical urban infrastructure	Serious gaming and water management
e Problem-based innovative learning: Saint Maarten Group Work	Mapping near-shore bathymetry data
Free monitor	Predicting the shape of future deltas
Wing monitors	WAMEX
Seasonal hydrological drought forecasting	Ships making waves
Sediment management in reservoirs	Predicting the coastal killer waves
Evaluating groundwater in times of scarcity and of abundance	Multi-objective rehabilitation of sewers
Forecasting floods	Photo-activated sludge process
Dealing with uncertainties	Tailored i-learning for sanitation professionals
Erasmus Mundus Master in Flood Risk Management	Sanitizing faeces by microwaves
Porous stone spillways	Citizens as water sensors: WeSenseIt
Predicting storm surges	Wastewater treatment on a green roof
Roads for water	WA+: an emerging global standard for water accounting
Improving performance of water utilities	Agent-based models of sociotechnical systems
Guidelines for roads development in flood plains	Uncapping MBR limitations
Tidal irrigation and drainage	Rapid assessment of climate change impacts on inlet-interrupted coasts
Arid land greening	Hybrid Master in Sanitation and Sanitary Engineering
Information & Knowledge Systems Water-Related Hazards & Climate Change	Drawing the line on coastline recession risk
Floating solutions for upgrading wet-slums	Ensemble hydro-meteorological prediction system

ANNEX 8. UNESCO-IHE PARTNERS: OVERVIEW BY REGION

1. REGION: AFRICA (Total of 59 partnerships)

Type: Education and Research, South

- International Institute for Water and Environmental Engineering (Ouagadougou, Burkina Faso)
- University of Burundi (Burundi)
- Centre de Recherches Geologiques and Minieres (Kinshasa, DR Congo)
- Hydraulics Research Institute (Cairo, Egypt)
- Helwan University (Cairo, Egypt)
- Eastern Nile Technical Regional office (Addis Ababa, Ethiopia)
- Addis Ababa University, Institute of Environment and Water Development Studies (Addis Ababa, Ethiopia)
- University of Development Studies (Tamale, Ghana)
- Kwame Nkrumah University of Science and Technology (Kumasi, Ghana)
- University of Nairobi (Nairobi, Kenya)
- Egerton University (Njoro, Kenya)
- Jomo Kenyata University of Agriculture and Technology (Nairobi, Kenya)
- MOI University (Eldoret, Kenya)
- Eduardo Mondlane University (Maputo, Mozambique)
- National University of Rwanda (Butare, Rwanda)
- Scientific and Technological Research Institute (Rwanda)
- University of Western Cape (Cape Town, South Africa)
- University of the Witwatersrand, Johannesburg, South Africa
- University of Free State South Africa (Bloemfontein, South Africa)
- University of Cape Town (Cape Town, South Africa)
- University of Johannesburg (Johannesburg, South Africa)
- University of Kwazulu Natal, School of Bioresources Engineering and Environmental Hydrology (Pietermaritzburg, South Africa)
- University of Khartoum (Khartoum, Sudan)
- University of Omdurman (Khartoum, Sudan)
- University of Dar-es-Salaam (Dar-es-Salaam, Tanzania)
- Sokoine University of Agriculture (Morogoro, Tanzania)
- Makerere University, Institute for Environment and Natural Resources (Kampala, Uganda)
- University of Zambia, School of Engineering (Lusaka, Zambia)
- University of Zimbabwe, Department of Civil Engineering (Harare, Zimbabwe)
- Ain Shams University, Faculty of Engineering (Cairo, Egypt)

Type: Network Water Sector, South

- African Sanitation Knowledge Network (Durban, Africa)
- Nile Basin Capacity Building Network (Cairo, Egypt)
- WaterNet Trust Southern Africa

Type: Water Sector Organisation

- Ministry of Water Resources and Irrigation (Cairo, Egypt)
- Ghana Water Company Limited (Accra, Ghana)
- African Water Association (Abidjan, Ivory Coast)
- Rift Valley Water Services Board (Kenya)
- Kenya Water Resource Management Authority (Kisumu, Kenya)
- Inkomati Catchment Management Agency (Nelspruit, South Africa)
- Department of Water Affairs and Forestry South Africa (Pretoria, South Africa)
- Komati Basin Water Authority (Pigg's Peak, Swaziland)
- Department of Water Affairs Swaziland (Swaziland)

- Dar es Salaam Water and Sewage Authority (Dar es Salaam, Tanzania)
- National Water and Sewerage Corporation Uganda (Kampala, Uganda)
- National Water and Sanitation Council of Zambia (Lusaka, Zambia)
- Department of Water Affairs Zambia (Lusaka, Zambia)

Type: Resource Partner Institute
- Accra City (Accra, Ghana)
- UNEP-Global Programme of Action (Nairobi, Kenya)
- UN-HABITAT (Nairobi, Kenya)
- Victoria Institute for Research in Development (Kisumu, Kenya)
- SNV - Regional Office East and Southern Africa (Nairobi, Kenya)
- National Water Research Commission SA (Pretoria, South Africa)
- Rhodes University, Institute for Water Research (Grahamstown, South Africa)
- Royal Swaziland Sugar Corporation (Simunye, Swaziland)
- Kampala City Council (Kampala, Uganda)
- Nile Basin Initiative Secretariat (Entebbe, Uganda)

Type: NGO / Civil Society
- Agency for Technical Cooperation and Development (Nairobi, Kenya)
- SANA (Nairobi, Kenya)
- National Association of Women's Organisations in Uganda (Kampala, Uganda)

2. REGION: SOUTHERN AND EASTERN ASIA (total of 68 partnerships)

Type: Education and Research, South
- Chittagong University of Engineering Technology (Chittagong, Bangladesh)
- Bangladesh University of Engineering & Technology (Dhaka, Bangladesh)
- Center for Environmental and Geographic Information Services (Dhaka, Bangladesh)
- Institute for Water Modelling (Dhaka, Bangladesh)
- Bangladesh Center for Advanced Studies (Dhaka, Bangladesh)
- Institute for Water and Flood Modeling, Bangladesh University of Engineering and Technology (Dhaka, Bangladesh)
- Royal University of Phnom Penh (Phnom Penh, Cambodia)
- Estuary and Coastal Science Research Center (Shanghai, China)
- Yunnan University, Asian International River Centre (Kunming, China)
- China Institute of Geo-environmental Monitoring, (China)
- Tsinghua University, Centre of International Transboundary Waters and Ecosecurity (Beijing)
- State Key Laboratory of Estuarine and Coastal Research (Shanghai, China)
- Nanjing Hydraulic Research Institute (Nanjing, China)
- China University of Geosciences (Beijing, China)
- Hohai University (Nanjing, China)
- International Research and Training Centre on Erosion and Sedimentation (Beijing, China)
- Anna University (Chennai, India)
- Housing and Development Corporation, Housing and Settlement Management Institute (New
- Delhi, India)
- Indian Institute of Technology, Department of Hydrology (Roorkee, India)
- Center for Environmental Planning and Technology University (Ahmedabad, India)
- Universitas SriWijaya (Palembang, Indonesia)
- Centre of Groundwater Resources and Environmental Geology, Ministry of Energy and Mineral
- Resources (Jakarta, Indonesia)
- Universitas Katolik Parahyangan (Bandung, Indonesia)
- National University of Laos (Vientiane, Lao PDR)
- National University of Mongolia (Ulaan Baatar, Mongolia)

- Mongolian University of Science and Technology (Ulaan Baatar, Mongolia)
- Tribhuvan University, Institute of Engineering (Pulchowk, Nepal)
- Department of Environment and Natural Resources, Mines and Geosciences Bureau (Philippines)
- University of Peradeniya (Peradeniya, Sri Lanka)
- University of Moratuwa (Moratuwa, Sri Lanka)
- Open University of Sri Lanka (Colombo, Sri Lanka)
- Taiwan International Institute for Water Education (Taipei, Taiwan)
- Changmai University, Unit for Social and Environmental Research (USER) (Changmai, Thailand)
- Khon Kaen University, Mekong Institute (Khon Kaen, Thailand)
- Chulalongkorn University (Bangkok, Thailand)
- Asian Institute of Technology (Bangkok, Thailand)
- Interstate Commission for Water Coordination of the Aral Sea Basin, Scientific Information
- Centre (Tashkent, Uzbekistan)
- Water Resources University Vietnam (Hanoi, Vietnam)
- CanTho University (Can Tho City, Vietnam)
- Southern Institute of Water Resources Research, (Ministry of Agriculture and Rural
- Development) (Ho Chi Minh City, Vietnam)
- Vietnam Institute of Meteorology, Hydrology and Environment (Hanoi, Vietnam)
- Viet Nam National University (Ho Chi Minh City, Vietnam)

Type: Network Water Sector, South
- Asia Pacific Water Forum (Asia)
- Capacity Knowledge Network Indonesia (Jakarta, Indonesia)

Type: Water Sector Organisation
- Chang-jiang Water Resources Commission (Wuhan, China)
- Xi'an Center of Geological Survey, China Geological Survey (Xi'an, China)
- Yellow River Conservancy Commission (Zengzhou, China)
- Yangtze Estuary Waterway Administration Bureau, Estuary and Coast Science Research Center (Yangtze, China)
- Ministry of Public Works Indonesia (Jakarta, Indonesia)
- Mekong River Commission (Vientiane, Laos)
- Department of Irrigation Nepal, Department of Irrigation (Lalitpur, Nepal)
- Foundation for Environment, Climate and Technology (Digana Village, Sri Lanka)
- Southern Institute of Water Resources Planning, Agriculture and Rural Development (Ho Chi
- Minh City, Vietnam)

Type: Resource Partner Institute
- Centre for Marine and Atmospheric Research (Clayton South, Australia)
- Chinese Academy of Sciences, Institute of Geographical Sciences and Natural Resources (Beijing, China)
- Institute for Global Environmental Strategies (Hayman, Japan)
- International Centre for Water Hazard and Risk Management (Ibaraki-ken, Japan)
- Korean Water Resources Corporation (Seoul, Korea)
- HYDRA Software Ltd. (New Zealand)
- Asian Development Bank (Manila, Philippines)
- Public Utilities Board Singapore (Singapore)
- Academy of Sciences of Tajikistan (Dushanbe, Tajikistan)
- Coordinating Committee Geoscience Programmes in East and Southeast Asia (Bangkok)

3. REGION: MIDDLE EAST (Total of 19 partnerships)

Type: Education and Research, South
- Power and Water University of Technology (Teheran, Iran)

- Regional Centre for Urban Water Management (Teheran, Iran)
- Hebrew University Jerusalem (Jerusalem, Israel)
- University of Jordan (Amman, Jordan)
- Al-Quds University (Palestine)
- Birzeit University, Institute for Environment and Water Studies (Birzeit, Palestine)
- An-Najah University (Nablus, Palestine)
- Sana'a University, Water Education Centre (Sana'a, Yemen)

Type: Water Sector Organisation
- Ministry of Water Resources Iraq (Bagdad, Iraq)
- Mekorot Water Company (Tel Aviv, Israel)
- Ministry of Water and Irrigation (Jordan)
- Jordan Ministry of Water Management and Irrigation (Amman, Jordan)
- Palestinian Water Authority (Al-Bireh, Palestine)

Type: Resource Partner Institute
- National Water and Wastewater Engineering Company (Teheran, Iran)
- Water Authority of Israel, Mekorot Water Company (Tel Aviv, Israel)
- Mekorot Water Company (Israel)
- King Abdul Aziz University (Jeddah, Saudi Arabia)
- King Abdullah University of Science and Technology (Dhahran, Saudi Arabia)
- Delta Research Institute (Delft, The Netherlands)

4. REGION: LATIN AMERICA (Total of 46 partnerships)

Type: Education and Research, South
- Universidad Blas Pascal (Cordoba, Argentina)
- Fundacion Natura Bolivia (Santa Cruz, Bolivia)
- Universidad Mayor de San Simon Bolivia, Centro de Levantamientos Aerospaciales, Aplicaciones SIG, (Cochabamba, Bolivia)
- Universidade de Sao Paulo (Sao Paulo, Brazil)
- Universidad Federal de Minas Gerais (Minas Gerais, Brazil)
- University of Brazil (Brasilia, Brazil)
- Federal University of Bahia (Salvador de Bahia, Brazil)
- HidroEX, Minas Gerais, Brazil
- Universidad Nacional de la Plata, Buenos Aires, Argentina
- Universidad del Valle (Cali, Colombia)
- Universidad Nacional de Colombia (Bogota, Colombia)
- Pontificia Universidad Javeriana (Bogota, Colombia)
- Universidad Nacional de Colombia, Posgrado en Bosques y Conservacion Ambiental (Medellin, Colombia)
- Universidad de Costa Rica (San Pedro, Costa Rica)
- REDICA - Central American Network of Educational Institutions (San Jose, Costa Rica)
- Costa Rica Institute of Technology (Cartago, Costa Rica)
- Instituto Nacional de Recursos Hidraulicos (Havana, Cuba)
- Universidad Politecnica de la Habana, Instituto Superior Politecnico "Jose Antonio Echeverria" (Havana, Cuba)
- Universidad San Francisco de Quito (Quito, Ecuador)
- University of Guayaquil (Guayaquil, Ecuador)
- Escuela Superior Politecnica de Litoral (Guayaquil, Ecuador)
- University of Guyana, Faculty of Technology (Georgetown, Guyana)
- Universidad Autónoma del Estado de Mexico (Mexico, Mexico)
- Instituto Technologico y de Estudios Superiores de Monterrey (Monterrey, Mexico)

- Universitas Tecnologica de Panama (Panama City, Panama)
- College of Science, Technology and Applied Arts of Trinidad and Tobago, Environmental Department (Port of Spain, Trinidad)
- University of the West Indies, St Augustin Campus, Faculty of Engineering (St Augustine, Trinidad and Tobago)

Type: Water Sector Organisation
- Saneamento Basico do Estado de Sao Paulo (Sao Paulo, Brazil)
- Instituto de Hidrologia Meterologia y Estudios Ambientales (Bogota, Colombia)
- Ministerio de Ambiente, Vivienda y Desarrollo Territorial (Bogota, Colombia)
- Asociacion de Corporaciones Autonomas Regionales y de Desarrollo Sostenible (Bogota)
- Centro de Preparacion Aulcola Mamposton (Habana, Cuba)
- Comision Nacional del Agua (Copilco, el Bajo, Mexico)
- Ministry of Environment, Uruguay (Montevideo, Uruguay)

Type: Resource Partner Institute
- Agencia Reguladora de Servicos Publicos Delegados de Estado do Ceara (Fortaleza, Brazil)
- Agencia Reguladora de Saneamento e Energia do estado de Sao Paulo (Sao Paulo, Brazil)
- Itaipu Binacional Company (Brazil-Paraguay)
- Ingenieria en Procesos de Gestion Ltda (Bogota, Colombia)
- Instituto Costaricense de Acueductos Y Alcantarillados (San Jose, Costa Rica)
- Institute of Water Technology (Morelos, Mexico)
- Water and Sewerage Authority of Trinidad and Tobago, Water Resources Agency (St Joseph, Trinidad)

Type: NGO / Civil Society
- Associacion Cubana de Produccion Animal (Habana, Cuba)
- Instituto de Investigaciones para la Industria Alimenticia (Habana, Cuba)
- Fundacion Ecuaciencias (Guayaquil, Ecuador)
- CUNOC (Guatemala City, Guatemala)
- Environmental NGO Baja de California (La Paz, Mexico)

5. REGION: EUROPE, US, AUSTRALIA (total of 50 partnerships)

Type: Education and Research
- University of Zagreb, faculty of Food technology and Biotechnology (Zagreb, Croatia)

Type: Resource Partner Institute
- Mondsee Institute for Limnology (Mondsee, Austria)
- Austria Academy of Sciences (Vienna, Austria)
- Ghent University (Ghent, Belgium)
- University of Natural Resources and Applied Life Sciences (BOKU), Vienna, Austria
- Institute of Chemical Technology (ICTP), Prague, Czech Republic
- Exeter University, Exeter, UK
- Algarve University, Faro, Portugal
- University of Kiel, Kiel, Germany
- University of Lodz, Lodz, Poland
- TU Dresden, Dresden, Germany
- Polytechnic University of Catalonia (UPC), Barcelona, Spain
- University of Ljubljana, Slovenia
- University of Toronto (Canada)
- International Secretariat for Water (Montreal, Canada)
- Exeter University (Exeter, England)
- Suez Environnement (Paris, France)

- Politechnica University Timisoara (Timisoara, Rumania)
- Dundee University, Centre for Water Law, Policy and Science (Dundee, Scotland)
- Stockholm Environmental Institute (Stockholm, Sweden)
- Lund University (Lund, Sweden)
- Swiss Federal Institute of Technology (Zurich, Switzerland)
- Waterboard Brabantse Delta (The Netherlands)
- Technical University Twente (The Netherlands)
- Ministry of Foreign Affairs, Director general of International Cooperation (The Hague, The Netherlands)
- Centre for African Studies, University of Leiden (Leiden, The Netherlands)
- Vitens-Evides Internationa (Zwolle, The Netherlands)
- Institute of Social Studies (The Hague, The Netherlands)
- Waternet Regional Water Authority Amsterdam (Amsterdam, The Netherlands)
- Delft University of Technology (Delft , The Netherlands)
- University of Amsterdam (Amsterdam, The Netherlands)
- Vewin - National Association of Water Operators (Rijswijk, The Netherlands)
- International Water Association (The Hague, The Netherlands)
- Vrije Universiteit Amsterdam (Amsterdam, The Netherlands)
- Nymphaea Communicatie en Media (Wageningen, The Netherlands)
- MetaMeta Consultants (Den Bosch, The Netherlands)
- Eijkelkamp Agrisearch Equipment BV (Giesbeek, The Netherlands)
- Rijkswaterstaat, Ministry of Public Works (The Hague, The Netherlands)
- WASTE Advisers on Urban Environment and Development (Gouda, The Netherlands)
- Nymphaea Communicatie en Media (Wageningen, The Netherlands)
- IRC, International Water and Sanitation Centre (The Hague, The Netherlands)
- Women for Water Partnership (Baarn, The Netherlands)
- Hogeschool Leeuwarden (Leeuwarden, The Netherlands)
- Wageningen University and Research Center (Wageningen, The Netherlands)
- Heriot-Watt University (United Kingdom)
- University of Nebraska-Lincoln, Lincoln, NE, USA
- Y ale University (New Haven, USA)
- National Oceanographic and Atmospheric Administration (Washington, DC, USA)
- Florida International University, Department of Earth & Environment (Miami, USA)
- University of Washington (Seattle, USA)

6. REGION: WORLD (Total of 16 partnerships)

Type: Network Water Sector, South
- Cap-Net Capacity Building Network for Integrated Water Management (Pretoria, South Africa)

Type: Resource Partner Institute
- European Union (Brussels, Europe)
- UNESCO International Hydrological Programme (Paris, France)
- United Nations University (Bonn, Germany)
- International Commission for Irrigation and Drainage (New Delhi, India)
- International Fund for Agricultural Development (Rome, Italy)
- International Water Management Institute (Colombo, Sri Lanka)
- World Meteorological Organisation (Geneva, Switzerland)
- International Union for the Conservation of Nature (Geneva, Switzerland)
- World Wide Fund for Nature (Gland, Switzerland)
- International Development Enterprises (Denver, USA)
- United States Army Corps of Engineers (Washington, USA)
- World Bank Institute (Washington, USA)
- The Nature Conservancy (Arlington, USA)

- Royal Netherlands Embassy (World)

Type: NGO / Civil Society
- WaterAid International (United Kingdom)

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