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Name	<b>Charlotte de Fraiture</b>
Nationality	Dutch
Present position	Professor in Land and Water Development

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## EDUCATION

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2003	- PhD Civil Engineering- Water Resources Management, University of Colorado, Boulder, USA.
2002	- MA Economics University of Colorado, Boulder, USA.
1990	- MSc Tropical Land and Water Management (Irrigation Engineering), Wageningen Agricultural University, the Netherlands
1984	- BSc Physical Geography, Utrecht State University, the Netherlands

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## EMPLOYMENT RECORD

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2012- present	- Professor in Hydraulic Engineering for Land and Water Development, Department of Water Science Engineering, UNESCO-IHE Delft, The Netherlands
2011 - 2012	- Principal researcher and project leader, International Water Management Institute (IWMI), Ouagadougou, Burkina Faso
2009 – 2010	- Principal researcher in Water Resources Management, project leader and Head of office, International Water Management Institute, Accra, Ghana
2003 – 2009	- Senior researcher, head Global Change and Environment, and Theme Leader Water Basin Management, International Water Management Institute, Colombo, Sri Lanka.
1997 – 2000	- Researcher in Irrigation, International Water Management Institute, Colombo, Sri Lanka
1996 - 1997	- Associate Expert in irrigation, International Water Management Institute, Cali, Colombia
1995	- Coordinator Irrigation Construction Unit, Mechi Hill Development Project, Ilam, Nepal
1992-1994	- District and regional irrigation engineer, Dhaulagiri Irrigation Development Project, Jomsom and Pokhara, Nepal
1990 and 1991	- Research assistant Wageningen Agricultural University, the Netherlands, field research Ile a Morphil Irrigation project, Senegal.

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## KEY QUALIFICATIONS

**20 years experience in research** in: agricultural water management, global water supply and demand, water economics, water pricing, water and biofuels, irrigation management, irrigation performance, irrigation management transfer.

**12+ years experience in research and project management:** project leader of research projects; head of office including personnel management and human resources, theme leader providing professional leadership in one of IWMI's four research themes.

**5 years experience in irrigation engineering and construction:** design, quality control and supervision of construction and rehabilitation works of village irrigation schemes. Progress reports, logistics and budget control.

## MAIN DISCIPLINE / SPECIALISATION

Agricultural water management, Irrigation engineering and management, Water economics.

Specific research interests:

- Small scale and informal irrigation and technology supply chains
- Irrigation performance and impacts on ecosystems
- Water and food security
- Global water supply and demand, global water scarcity
- Energy and water; impact of biofuel policies on water use
- Virtual water and trade



## EXPERIENCE in PROJECT MANAGEMENT, CONSULTANCY and EDUCATION

### Selected Projects

2014 – present	Project director of “Capacity Development of Higher Education Institutes in Small-Scale Irrigation” funded by NUFFIC, the Netherlands
2013 – present	Project leader of project “Investing in land and water using climate finance mechanisms” in Ethiopia and Indonesia. Funded by Dutch Science Council (NWO)
2013 - present	Project leader of project “co-management of wetlands and irrigation in Lake Victoria basin” in Kenya. Funded by Dutch government.
2010 – present	Co-applicant and scientist of DRiP project – “Drip irrigation Realities in Perspective” in Morocco and Burkina Faso). Lead by Wageningen University. Funded by Dutch Science Council (NWO) and DFID
2014	Reformulation of the Multi-annual Water Development Plan (PPEA-II) Water and Food Security component for the Dutch Embassy in Benin
2009-2011	Project leader of Agricultural Water Solutions project, consortium led by IWMI consisting of IFPRI, FAO, SEI and IDE, identifying promising investment options in irrigated smallholder farming in Ethiopia, Zambia, Tanzania, Ghana, Burkina Faso and India; formulate business models to engage in agricultural water management. Funded by Bill and Melinda Gates Foundation
2009-2010	Project leader of Agricultural Water Management in challenging contexts project, in Ethiopia, Ghana, Burkina Faso, Nepal and Sri Lanka, funded by IFAD, formulate guidance on how to design and implement context specific AWM projects in different institutional set-ups.
2004-2009	Lead scientist in the development of global water and food modelling tools and computation of scenarios for the Comprehensive Assessment of Water Management for Agriculture (CA). <ul style="list-style-type: none"> <li>• Development of global water and food supply and demand modelling tools, global scenarios and links between energy (biofuels), virtual water &amp; trade.</li> <li>• Development of global water scarcity map</li> </ul>
2006	Contributing and lead author in the International Assessment of Agricultural Science and Technology (IAASTD)
1997-2001	Scientist developing irrigation performance indicators and their application to gauge the impact of Irrigation Management Transfer (IMT).
2005, 2007, 2008 & 2009, 2011, 2013	Lead and/or contributing author of research proposals, funded by BMGF, IFAD, BMZ, OPEC, NWO and Wotro
1994	Evaluation mission and auditing of construction of mule trail, implemented by ILO (food for work program), Nepal
1991	Evaluation research of irrigated vegetable gardens for women groups in Senegal, implemented by Wageningen University and Dutch Government.



## Professional Experience

2014 – present	Chairperson of the Examination Board at UNESCO-IHE
2014 – present	Member of the Scientific Program Committee of the Stockholm Water Week
2013 – present	Academic responsibilities: Main promotor of 10 PhD candidates (ongoing). Co-promotor of 4 PhD candidates. Supervision of 81 MSc students (25 ongoing). Postgraduate Teaching and curriculum development.
2013 – present	Chairperson of the Netherlands National Committee of the International Committee of Irrigation and Drainage (ICID)
2012 – present	Member of the Steering Committee of the CGIAR Consortium Research Program (CRP) on Water Land and Ecosystems (WLE)
2012, 2014	Review of research proposals: Member of ITN Review Panel of European Union Horizon 2020 program; ERC proposal reviewer,
2013	Editor of the journal Water Resources and Rural Development
2009 and 2013	Guest editor of two special issues of the Agricultural Water Management journal.
2005 - 2014	Regular reviewer of scientific manuscripts for, among others, journals Agricultural Water Management, WRR, IWJRM, WaRM, Irrigation Science, Irrigation & Drainage, Water International, Water Alternatives, GEC, Water Policies and others
2007-2014	Member international jury of Junior Stockholm Water Prize
2007- 2011	Principal researcher, International Water Management Institute (based in Burkina Faso, Ghana and Sri Lanka). Supervision of scientists, postdocs, interns and students
2010	Head of Office, West Africa office of the International Water Management Institute, Accra, Ghana. - IWMI representative in Ghana., Personnel management of regional office (25 employees), Budgets control and administration, Liaison of hosted programs.
2007-2008	Theme leader in Basin Water Management, International Water Management Institute, Sri Lanka - scientific leadership of the research theme, responsible for quality and timely outputs, review and quality control of publications, proposal development, supervision of interns and students
2005-2007	Head of Global Change and Environment group at International Water Management Institute, Sri Lanka - scientific leadership, quality control and coordination of research projects
1996-2003	Researcher at International Water management Institute, Colombia and Sri Lanka
1992 – 1995	Irrigation engineer at several irrigation development projects in Nepal: Design of construction and rehabilitation of village irrigation schemes, feasibility studies and meetings with farmer groups; quality control, construction supervision, technical trainings, logistics, procurement and budgeting
1990	Teaching assistant, co-organizer irrigation design practice for MSc. students, Agricultural University Wageningen, The Netherlands.



## LANGUAGE PROFICIENCY

Language	Reading	Speaking	Writing
Dutch	Mother tongue	Mother tongue	Mother tongue
English	Excellent	Excellent	Excellent
French	Excellent	Good	Moderate
Spanish	Good	Moderate	Slight
German	Good	Moderate	Slight

## PUBLICATIONS

Google scholar profile: <http://scholar.google.com/citations?user=o54X5poAAAAJ&hl=nl>

### More than 50 peer reviewed publications and over 60 other publications

- **10 most cited peer reviewed publications (Google Scholar, April 2015)**

1. De Fraiture, C.; Y, Liao, M, Giordano. 2008. Biofuels and agricultural water use: blue impacts of green energy. *Water Policy* 10(S1): 67-81
2. Molden, DJ, R Sakthivadivel, CJ Perry, C de Fraiture, WH Kloezen. 1998. *Indicators for comparing performance of irrigated agricultural systems*. IIMI research report 20 (26p.) IWMI Sri Lanka
3. Lundqvist, J. C de Fraiture, D. Molden. 2008. *Saving water: From Field to Fork- Curbing losses and wastage in the food chain*. SIWI Policy Brief. Swedish International Water Institute: Stockholm
4. De Fraiture, C., X. Cai, U. Amarasinghe, M. Rosegrant and D. Molden. 2004. *Does cereal trade save water? The impact of virtual water trade on global water use*. IWMI-CA Research Report, IWMI Sri Lanka
5. De Fraiture, C., D. Wichelns, E. Kemp Benedict, J. Rockstrom. 2007. *Looking ahead: scenarios on water for food and environment*. In Molden (ed): *Water for Food, Water for Life: A Comprehensive Assessment of Water Management in Agriculture*. Earthscan (UK) and IWMI (Sri Lanka)
6. De Fraiture, C.; D. Wichelns. 2010. Satisfying future water demands for agriculture. *Agricultural Water Management* 97(4): 502–511
7. Molden, D, K. Frenken, R. Barker and C. de Fraiture. 2007. *Trends in water and agricultural development*. In Molden (ed): *Water for Food, Water for Life: A Comprehensive Assessment of Water Management in Agriculture*. Earthscan (UK) and IWMI (Sri Lanka)
8. Amarasinghe, U, B. Sharma, N. Aloysius, C. Scott, V. Smakthin, C. de Fraiture, A.K. Sinha and A.K. Sukla. 2005. *Spatial variation in water supply and demand across river basins of India*. IWMI Research Report 83. IWMI (Sri Lanka)
9. De Fraiture, C. and C. Perry. 2007. *Why Is Agricultural Water Demand Irresponsive at Low Price Ranges?* In: Molle and Berkhoff (eds) *Irrigation water pricing: the gap between theory and practice*. Wallingford, UK, and Colombo: CABI Publishing and International Water Management Institute.
10. De Fraiture, C.; D. Molden; D. Wichelns. 2010. Investing in water for food, ecosystems and livelihoods. *Agricultural Water Management* 97(4): 495–501

- **10 most recent peer reviewed journal papers & book chapters (April 2015):**

1. Mersha, A., C de Fraiture, A. Mehari, I Masih, T Alamirew. 2015. Integrated Water Resources Management: Contrasting principles, policy and practice in the Awash River Basin, Ethiopia. *Water Policy* (published online)
2. Gebrehiwot, KA, A Mehari Haile, C de Fraiture. A Demissie Chukalla, TG Embaye. 2015. Optimizing Flood and Sediment Management of Spate Irrigation in Aba'ala Plains. *Water Resources Management* (2015) 29:833–847
3. Wanvoeke, J, JP Venot, M Zwarteveen, C de Fraiture. 2015. Performing Success: the case of drip irrigation in Burkina Faso. *Water International* 40(3): 432-445
4. De Fraiture, C., A. Fayrap, O. Unver and R. Ragab. 2014. Integrated Water management approaches for sustainable food production. *Irrigation and Drainage* 63(2): 122-231.



5. Venot, JP et al. 2014. Beyond technology and potential: the actors who make drip irrigation. *Irrigation and Drainage* 63(2): 186-194.
6. De Fraiture, C.; M. Giordano. 2014. Smallholder private irrigation, a thriving but overlooked sector. *Agricultural Water Management* 131 (2014) 167– 174.
7. Giordano, M. ; C. de Fraiture. 2014. Enhancing benefits and managing trade-offs. *Agricultural Water Management* 131 (2014) 167– 174
8. De Fraiture, C. ; H. Sally, G. Ndanga, P. Kabore, 2014. Pirates or pioneers: the unintended way of using water from small reservoirs in Burkina Faso. *Agricultural Water Management* 131 (2014) 212– 220.
9. Namara, R.E.; E. Owusu, L. Hope; C. de Fraiture; D.Owosu. 2014. The use of water lifting devices in Ghana: opportunities and challenges. *Agricultural Water Management* 131 (2014): 194-203.
10. Namara, R. E., Gebregziabher, G., Giordano, M. A. and de Fraiture, C. 2013. Small pumps and poor farmers in Sub Saharan Africa: An assessment of current extent of use and the poverty outreach. *Water International* 38(6): 827-839.

### Training units

Four units in Smith, L. (Ed.). C126 - Water resources management. 10 units. [Training/Course material]. London, UK: University of London. School of Oriental and African Studies (SOAS); Centre for Development, Environment and Policy (CeDEP); Colombo, Sri Lanka: International Water Management Institute (IWMI).

- 1) de Fraiture, Charlotte; Manning-Thomas, N.; Molden, David. 2009. Unit one - Water resources and scarcity. In Smith, L. (Ed.). C126 - Water resources management. 10 units. [Training/Course material].
- 2) de Fraiture, Charlotte; Molden, David; Smith, L.; Varma, Samyuktha. 2009. Unit two - Key concepts: assessment and management from basin to user. In Smith, L. (Ed.). C126 - Water resources management. 10 units. [Training/Course material]
- 3) Molden, David; de Fraiture, Charlotte; Atapattu, Sithara S.; Smith, L. 2009. Unit six - Water use in agriculture: small-scale irrigation and rainwater harvesting. In Smith, L. (Ed.). C126 - Water resources management. 10 units. [Training/Course material].
- 4) Molden, David; de Fraiture, Charlotte; Atapattu, Sithara S.; Smith, L. 2009. Unit seven - Water use in agriculture: large-scale irrigation.

### PhD. Thesis

The use of entropy optimization principles in parameter estimation. Applications to global water demand modelling. Dept. of Civil Engineering & Water Resources Management. University of Colorado, Boulder, USA (2003)

### MA. Thesis

The impact of volumetric water pricing on agricultural water use and farmer profit. A multi-scale modelling framework. Dept. of Economics at University of Colorado, Boulder, USA (2002)

### MSc. Thesis

Participatory irrigation design of a village irrigation scheme in Senegal. Tropical Land and Water Management, Wageningen Agricultural University, the Netherlands (1990)