

Project: Innovative training approach in the technology-assisted environment for
water management-PARADOX, 2020-1-UK01-KA203-078871

Intellectual Output 1

PARADOX Methodological Framework

- EXECUTIVE SUMMARY-

T

he **PARADOX Project** aims at developing knowledge and skills among practitioners in water management. The recipients of the project are professionals, however the beneficiaries are all the university members as the results of the project will cause more efficient academic work on water management field, including research, in which the vested stakeholders can be included with all their knowledge and experiences. The philosophy that stands behind the outcomes of PARADOX Project is to create the synergic methodology and a set of tools that release, and joint knowledge distracted in academic world of information.

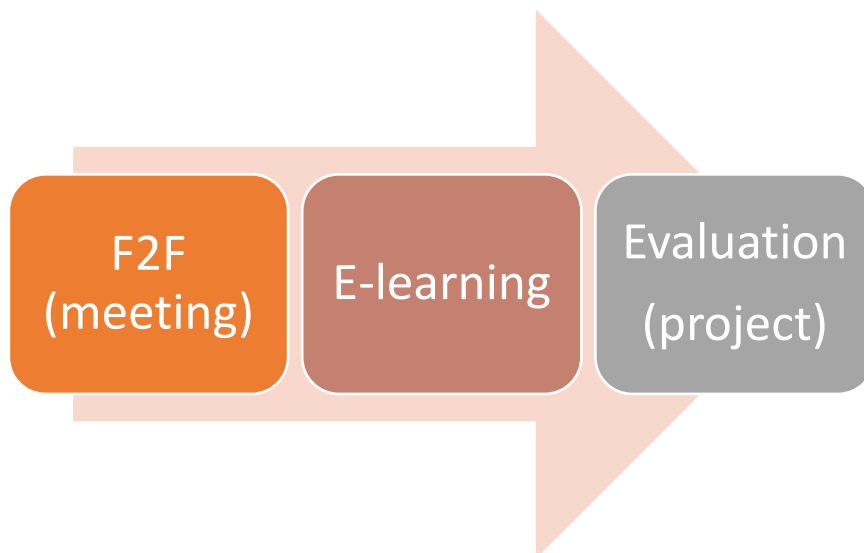
The training course that will be developed in PARADOX project is based on needs of sector, expressed in needs analysis conducted within the project. But it is also based on following assumptions: it should be universal, addressed to a wider pool of professionals, two dimensional: basic knowledge and skills are always followed by the deeper knowledge or references, modular, practical, with practical tips, cases and scenarios of workshops, open for sharing experiences and good practices, by its interactiveness, short and easy to be implemented, however its multidimensional structure makes it very rich in content.

The learning and training material consists of: training pathways, definition of learning content, harmonization of learning modules and training content integration.

The content consists of six modules, divided into respective chapters:

- Chapter 1. GOVERNANCE AND MANAGEMENT OF WATER RESOURCES
- Chapter 2. SOCIAL, ECONOMIC AND ENVIRONMENTAL ASPECTS
- Chapter 3. SUSTAINABLE WATER MANGEMENT LEGISLATION
- Chapter 4. SUSTAINABLE WATER MANAGEMENT INDICATORS
- Chapter 5. WATER RESOURCES SYSTEMS PLANNING AND MANAGEMENT
- Chapter 6. ENGINEERING HYDROLOGY

The methodology of the training course is based on blended learning model:



The project will provide the web page with all materials to be downloaded, and the open to be self – registered by the user LMS (Learning Management System).

Co-funded by the
Erasmus+ Programme
of the European Union



The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission or the National Agency cannot be held responsible for any use which may be made of the information contained therein.

© 2022, PARADOX project, 2020-1-UK01-KA203-078871
www.paradoxproject.eu

Project: Innovative training approach in the technology-assisted environment for water management-PARADOX, 2020-1-UK01-KA203-078871

Intellectual Output 1

PARADOX Methodological Framework

Co-funded by the
Erasmus+ Programme
of the European Union



The European Commission's support for the production of this publication does not constitute an endorsement of the contents, which reflect the views only of the authors, and the Commission or the National Agency cannot be held responsible for any use which may be made of the information contained therein.

© 2022, PARADOX project, 2020-1-UK01-KA203-078871

www.paradoxproject.eu

Table of contents

Preface	3
Needs analysis	4
Needs and recommendation for the project	4
The idea	6
The structure	7
The handbook	7
The manual for trainers.....	7
Guide for communication.....	7
The content	9
The methodology	9
The facilities (needs)	11
Annexes	11
Annex 1. Research report on needs analysis	12
Annex 2. Selected bibliography for teaching modules.....	17

Preface

Connected, insightful water leadership in Europe is increasingly vital in adapting to climate impacts, new circular economies, digitalisation and a more diverse labour market. We know that water and climate change impacts do not recognise political boundaries. Water management professionals are key to future adaptation – Paradox tailored training programme supports water-sector personnel to build key skills to accompany technical expertise in water management for resilient cities, agriculture and industry.

The Paradox Project aims at developing knowledge and skills on water management. The recipients of the project are a wide pallet of professionals as the results of the project will cause more efficient academic work on every field, including research, in which the highly qualified professionals can be included with all their knowledge and experiences. The philosophy that stands behind the outcomes of PARADOX Project is not to teach the academics, but to create the synergic methodology and a set of tools that release, and joint knowledge distracted in academic world of information.

Needs analysis



For proper preparation, the narrative research was done among partner countries (see the extended report in Annex 1). The 35 respondents from 8 countries took part in the research. Most of the respondents have relevant knowledge background, so there's no need to include it in the materials, however, some of them, especially from other areas than natural resource management and planning don't, so there could be a link to some basic information as well.

Almost all the respondents worked in areas which project outcome is seen as beneficial for professional development.

Needs and recommendation for the project

- ❖ The communication skills were among the most common, but it was not specified what kind of communication skills are most wanted. However, from the context of other responses and answers it can be concluded that:
 - The language skills are needed. Especially regarding some specific areas. Of course, it is impossible for the project to learn English, however some tips, or links to specific dictionaries could be included into library.
 - The communication skills are also related to the ways of communicating. It may be useful to give some practical knowledge about how to use infographics or pictures to support words. Especially that visual concept of ppts were among needs.
- ❖ Also IT skills were needed. Especially concerning searching for English materials on specific topics. It could be good also to include into the IT sphere some communication tools, like LMS, or project management systems in order to allow working with students in both ways: in group and individually.
- ❖ There's a need of supportive skills for professionals.
- ❖ One of the most important topic is how to find expectations of participants.
- ❖ Methodological skills. What is important here, it doesn't mean the training handbook on methods in general, as it was mentioned, most of the trainers have the basic preparation for didactic work. It means such methods that can be used in multicultural environment. Methods that are inclusive. It can be useful to take some ideas and methods from the philosophy of inclusive education (like mixing methods, or peer learning).

- ❖ Some of trainers are getting their experience by visiting abroad universities. So it may be very useful to give some information on how to deal with lecturing in non-native environment. For example, how to prepare culturally neutral lecture.
- ❖ It is worth considering creating many cases as a basement for PBL method. Cases are also good to exchange and sharing experiences. What should be stressed here is that by exchanging experiences, for example about learning methods, we can do things better and more efficient. The solutions are invented, but we may do not know them.
- ❖ The needs also emerge concerning preparation for learning and the process of learning itself. It is because students from other systems can have different pre-knowledge, different attitude to the learning process. It could be good to have the ability to teach what are the expectations of the domestic system, or the respective lecturer. In other words: some knowledge how to learn should be possible to be taught.
- ❖ There should be some propositions of assessment that would not create unnecessary stress. Organizing exams that are not stressful will be also useful for domestic students and will increase motivation for learning.
- ❖ As it is visible from the list of respondents, there are mostly people from vested fields. It is worth to be considered how to attract participants from other fields as well.

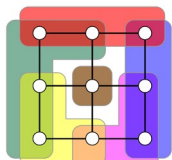
The idea



The training modules within the PARADOX Project presents following features:

- ❖ it is universal, addressed to any kind of professionals, no matter the fields of knowledge is;
- ❖ it is two dimensional: basic knowledge and skills are always followed by the deeper knowledge or references;
- ❖ it is structured; all the parts of the training modules are combined and present as a full package, but is also possible to be used according to the needs;
- ❖ it is modular, each module is dealing with other filed of knowledge;
- ❖ it is based on the needs;
- ❖ it is practical, it includes practical tips, cases and scenarios of workshop;
- ❖ it is open for sharing experiences and good practices, by its instructiveness.
- ❖ it is based on blended learning system, using modern ICT as web page and LMS, but is also based on traditional meetings with workshop and brainstorming.
- ❖ it is varied in means includes texts, videos, infographics, presentations, scenarios and many more features that can be useful on the issue.
- ❖ is short and easy to be implemented, however its multidimensional structure makes it very rich in content.

The structure



The package for trainee and trainers are consist of six modules:

The handbook

The training handbook is divided into six modules, with the preface including information about the project, its goals and methodology. The modules include four areas of needs:

- Chapter 1. GOVERNANCE AND MANAGEMENT OF WATER RESOURCES
- Chapter 2. SOCIAL, ECONOMIC AND ENVIRONMENTAL ASPECTS
- Chapter 3. SUSTAINABLE WATER MANGEMENT LEGISLATION
- Chapter 4. SUSTAINABLE WATER MANAGEMENT INDICATORS
- Chapter 5. WATER RESOURCES SYSTEMS PLANNING AND MANAGEMENT
- Chapter 6. ENGINEERING HYDROLOGY

The details of the modules are revealed in the content section.

The structure of the training handbook should be simple but two dimensional: (1) with basic information on the topic, references to the workbook, and (2) references to additional material, or, in some cases, the additional material is included in the workbook. The basic material is created in such a way that it can be easily printed by the user (it has printable version of each module).

The delivery is enriched with digital library, which is the repository of references on each topic that will allow to deepen the knowledge on the subject.

The manual for trainers

It will be a short document with the methodology of the course. So everyone that completes the course can be a trainer and thus spread the project making a snowball effect. The manual will include also practical tips on how to convince the academic staff to go into the course. This can be done by giving the advantages of better working in multicultural environment.

The manual will include a Guide for communication. This is the short, easy to show document that is a set of the most important information on communication skills and issues raised in the handbook. Its purposes are as a tool for dissemination of the course, to help in convincing to

the content of the course, to have ready-to-use core of the content of the course when needed.
This guide is based mostly on infographics. It has also the printable version.

The content



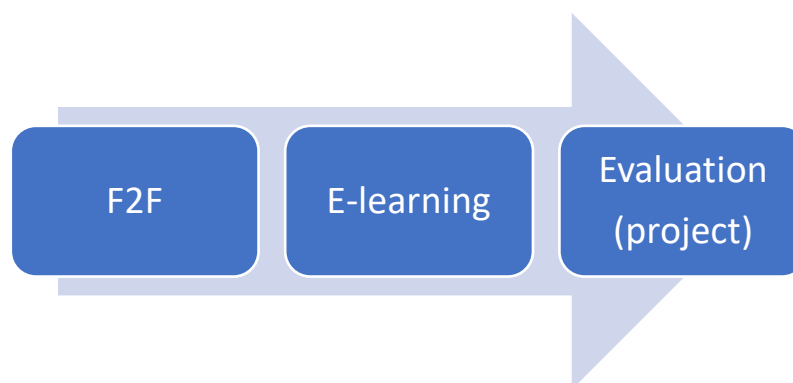
The content is varied and rich. It consists mainly of texts, but also with videos, links (references), tips, tests to make self-evaluation. It is divided to four modules:

- Chapter 1. GOVERNANCE AND MANAGEMENT OF WATER RESOURCES
- Chapter 2. SOCIAL, ECONOMIC AND ENVIRONMENTAL ASPECTS
- Chapter 3. SUSTAINABLE WATER MANGEMENT LEGISLATION
- Chapter 4. SUSTAINABLE WATER MANAGEMENT INDICATORS
- Chapter 5. WATER RESOURCES SYSTEMS PLANNING AND MANAGEMENT
- Chapter 6. ENGINEERING HYDROLOGY

The methodology



The methodology is based on blended learning that includes face to face meeting, and on-line course using the LMS platform, with the possibility of self-registration. The structure o the course is as follows:



The first meeting is needed to explain the goals and the methodology of the course. During this meeting the workshops on introduction to water management are done, with the ice breakers and integrative workshops that can be done later with the participants. However, as the e-learning course is complete and can be used by as many people as it is possible, the scenario of the first meeting is included in the manual for trainers. Thus, this meeting is an important, but somehow added value.

The e-learning part refers to two tools: web page with the materials, especially the digital library that is an open source of knowledge. During the time of the project, the digital library is also opened to be built, the participants are asked to give their propositions of the materials to be input. The propositions are verified by the partner responsible for the respected module. Second part is an online course on LMS platform. The course is divided into 6 modules accordingly to the handbook. Each module consists of material that are part of the handbook, practical part from the respected module of the workbook, a forum to share the experiences. The topic of each forum will be set as a question or the thought to be developed. Each module is ended with the self-paced test.

The evaluation part consists of two parts and is included into LMS. First part is a satisfaction questionnaire that will help to evaluate. The second part is a bank of cases. To complete the course, the participants are required to prepare a project-based case of working in water management environment; it can be a case of good practice of working with students, lecturing, abroad, solutions in academic works, etc. Of course, related closely with the international aspect of the project: multiculturalism.

The course can be finished with the certificate on the condition that the participant will do all the tasks that are graded: chosen exercises from workbook (these exercises are marked with the “graded” sign along with the certificate sign), do the self-paced test and send the graduation project task (the case). The certificate will be awarded if the number of 75% of points will be achieved.

The facilities (needs)



- ❖ web page with the training kit and the digital learning resources.
The web page is also equipped with link to self-registered access to the LMS section, where the on-line course is.
- ❖ LMS section on the website with e-course and access after authentication (username and password);
- ❖ all materials that are not produced by the partners have copyright, i.e. have CC license or adequate.

Annexes

Annex 1. Research report on key competences needs analysis

Annex 2. Selected bibliography for teaching modules

01

Framework of PARADOX

Needs analysis

The evaluation of the Key Competence Report (KCR) produced by the PARADOX partners was conducted by examining its content in relation to the aims. The main aim of evaluating the KCR was to assist the project team in improving the content of the KCR. Therefore, the evaluation attempted to answer the following questions:

1. To what extent the methodology used was adequate to the aim?
2. What proportion of the stakeholders was consulted?
3. What stakeholders' groups were underrepresented?
4. What are the similarities regarding the responses from the participant countries?
5. What are the main differences regarding the responses from the participant countries?
6. What data we still need to collect in order to be able to formulate the learning outcomes?
7. To what extent the KCR was useful in defining the academic and professional profiles?
8. To what extent the KCR was helpful in guiding the process of outcome formulation?
9. To what extent did the KCR assisted the project partners in constructing a common language?
10. How did proposed methodology assist us in developing the KCR?

The internal evaluation of the KCR is part of the Quality Assurance process and aims at improving the quality of the project outputs. It also aims at encouraging collaboration and communication between the partners in this project. By critically evaluating each other's work we aim at developing the way in which we work within the project and ultimately at enhancing the quality of the main outputs.

1. *To what extent the methodology used was adequate to the aim?*

To collect data on KCR we have used the TUNING project survey model. The outline of the TUNING survey was distributed to project partners and the recommendation was to use it as a guide. The partners were encouraged to use their own surveys if they so wished. The advantage of using a similar methodology consisted in the fact that the results were easier to compare. However, by examining the reports by country we can note that TUB and UNIPA had not followed the TUNING closely and this creates problems when trying to compare the results.

2. *What proportion of the stakeholders was consulted?*

To identify the key competences, surveys were conducted in Portugal, Estonia, Spain, Romania, Italy, Greece and the United Kingdom involving university lecturers, practitioners, local authorities, water management authorities. The report fails to explain to what extent the respondents are representative to the population. Although a reasonable large number of stakeholders were surveyed, we are not sure of the reliability of our conclusions. To address this, we think that when designing the learning outcomes, we need to consult a larger number of stakeholders. We need to formulate the profile of the trainees and present to the stakeholders the learning outcomes of the programme. We trust that in this way we will be able to collect valuable opinions and design the structure of the programme so that the learning outcomes will respond to the market demand.

3. *What stakeholders' groups were underrepresented?*

By analysing the content of the KCR it seems like we have mostly consulted colleague lecturers and students. We, it seems, failed to consult ground people, hazard combat brigade. Although in their reports UPM, EVM and EMU have listed the groups that were consulted it is difficult to assess what group expressed what views. To correct this shortcoming, we need to consult each group by presenting to them the profile of the future graduate and the learning outcomes of each of the modules that will be part of the programme. A structure will be presented so that all partners follow a similar model.

4. *What are the similarities regarding the responses from the participant countries?*

Since the methodology employed was not entirely standardised the comparison is not easy to make. However, a couple of common features emerge:

-Employers' opinions

Ability to apply knowledge to practice; basic general knowledge in environmental hazard behaviour; capacity to learn; ability to work in a team; planning and management abilities; information management competences;

-Employees opinions

Ability to apply knowledge to practice; decision making capacity; capacity to adapt to newsituations; ability to solve problems; ability to work as a member of a team; analysis and synthesis capacity; capacity to manage own time; capacity to generate ideas; concern for quality.

-Academics' opinions

Capacity to conduct research; competence to use the IT; decision making competences; ability to work as member of a team; interpersonal competences.

5. *What are the main differences regarding the responses from the participant countries?*

The structure of the reports was different and therefore the comparison is not easy to make. However, a couple of main differences emerge:

*Employers' opinions

-Understanding the culture of other countries (UK-important; EE-Not important;)

-Leadership (UK-Important; PT-Not important; ES-Important, RO-Important; EE-Not mentioned)

-Ability to work in an international context (UK-Important; PT-Not important; RO-not mentioned; ES-Important, EE-not mentioned)

-Initiative and entrepreneurial spirit (UK-Important; PT-Important; RO-Important; ES-Important; EE-not mentioned)

*Employees (students') opinions

-Initiative and entrepreneurial spirit (PT-Not important; UK-Important; RO-Important; ES-Not important; EE-Important)

-Capacity to generate new ideas (RO-not important; EE-not mentioned; UK-Important; ES-not important, PT-not mentioned)

-Critical and self-critical competences (PT-not important; RO-important; ES-important; UK-important; EE- important)

-Ability to work in an interdisciplinary team (PT-not important; UK-important; EE not mentioned; RO-not mentioned; ES-important)

-Ethical commitment (UK-Important; EE-not important; RO-important; PT-not mentioned; ES-Important)

*Academics' opinions

-Ethical commitment (UK-important; EE-not important; RO-not mentioned; PT-Important; ES-Important)

-Oral and written communication in own language (UK-not important; EE-not important; RO-not mentioned)

-Knowledge of a secondary language (UK-not important; EE-not important; RO-important; ES-important)

6. *What data we still need to collect in order to be able to formulate the learning outcomes?*

By analysing the KCR we think that we need to collect more information regarding key stakeholders' opinions on practical environmental hazards prevention techniques; specific situation knowledge; essential skills; what disaster command centre is best to work with.

7. *To what extent the KCR was useful in defining the academic and professional profiles?*

By conducting the surveys and collecting data on key competences we have managed to better understand the main features of the future graduate of technology-assisted training for water management. However, interviews with potential beneficiaries and people who work on the ground, environmental hazards prevention brigades will enable us to better understand the most important elements that we need to address.

8. *To what extent the KCR was helpful in guiding the process of outcome formulation?*

The KCR is an essential element that should be now used when deciding on the structure of the modules and the content of each of the module. The extent to which we trust the CKR reflects the reality will give a strong support to our rationale.

9. *To what extent did the KCR assisted the project partners in constructing a common language?*

If we used a more standardised mode of presentation the communication between us would have gained in strength. We need to use the TUNING methodology and theoretical framework if we are to facilitate our understanding of key terms when designing the programme. The feeling is that there is still a lack of understanding regarding the terminology we need to employ and even the meaning of some of the main concepts.

10. *How did TUNING methodology assist us in developing the KCR?*

Apart from using TUNING methodology to facilitate communication between partners we need to study existing good practice when developing the modules and when deciding on the link between the required competences and the formulation of the learning outcomes. We also need to look into other projects that were based on TUNING, especially those conducted in the area of natural resources management.

The evaluation was based on discussion with students, lecturers, employers, and partners in the project.

Results have been compiled by Florin Ioras of Buckinghamshire New University, UK, based on reports put together by:

- EYEBB-UK
- TUB- RO
- ACIF - PT
- EMU - EE
- UPM - ES
- EVM – ES
- UNIPA – IT
- IHU - GR

Annex 2. Selected bibliography for teaching modules

Selected bibliography

- Albert J., 2001, "Unconventional Supplies" and the Water Dispute Among the Riparians of the Jordan River Watershed. *Journal of Contemporary Water Research and Education*, 118(1).pp 44-59.
- Argles, T. (2005) *Minerals: Bulk Materials for Building and Industry* (Book 2 of S278 *Earth's Physical Resources: Origin, Use and Environmental Impact*), The Open University, Milton Keynes.
- Bakker K, Kooy M, Shofiani N.D, Martijn E-J, 2008, Governance Failure: Rethinking the Institutional Dimensions of Urban Water Supply to Poor Households, *World Development*, 36(10),1891-1915.
- Berube G.G,Villeneuve F., 2002, Ethical dilemmas and the decision-making process. Is a consensus realistic? *Energy Policy*, 30 (14), pp. 1285-1290.
- Berubé G.G., Cusson C., 2002, The environmental legal and regulatory frameworks. Assessing fairness and efficiency, *Energy Policy* 30 (14), pp. 1291-1298.
- Choguill, C., Franceys, R.W. and Cotton, A.P, 1993, *Planning for Water and Sanitation*.University of Sheffield: Centre for Development Planning Studies.
- Comprehensive Assessment of Water Management in Agriculture. 2007. *Water for Food, Water for Life: A Comprehensive Assessment of Water Management in Agriculture*. London: Earthscan, and Colombo: International Water Management Institute
- DEFRA (2002) *Achieving a better quality of life: Review of progress towards sustainable development* (PB6811).
- DEFRA (2004) *Key facts about: Inland water quality and use*. Available online at <http://www.defra.gov.uk/environment/statistics/inlwater/index.htm> [last accessed December 2004].
- Donin G, Leone A., 2011, *Participatory development and the water sector: a new 'tyranny' of development cooperation or an important opportunity for a politicised and radical development practice*. Luxembourg: Publications Office of the European Union.
- Environment Agency (2001) *Water resources for the future: A strategy for England and Wales*. Available online at <http://www.environment-agency.gov.uk/>, [last accessed December 2004].
- Environment and Development Division (EDD), 1997 *Guidelines on water and sustainable development: principles and policy options*. Thailand: UNESCAP.
- European Union (1998) *Drinking Water Directive 98/83/EC*, available online at <http://europa.eu.int/comm/environment/water/water-drink/index.en.html> [last accessed December 2004].
- GCWA, 2006, *Keeping the promise: An agenda for action on women and girls*. The Global Coalition on Women and AIDS. Available at: http://www.unfpa.org/upload/lib_pub_file/597_filename_keeping-the-promis...

- Gleick P.H., 2000, Changing Water Paradigm: a look at twenty-first century water resource development. *Water International*, 25(1), pp.127-138.
- Goulden, M., Conway D. and Persechino.A., 2008. "Adaptation to Climate Change in International River Basins in Africa: a Review." Tyndall Centre Working Paper 127.
- Groenfeldt D., 2000, A global consensus on Participatory irrigation Management. In: Groenfeldt and Svendsen eds.2000, Case studies in Participation Irrigation Management, Washington: World Bank Institute.
- Grun R.E., 2006. Monitoring and Evaluating Projects: A step-by-step Primer on Monitoring, Benchmarking, and Impact Evaluation. Washington DC: World Bank.
- Hayes, L., 2005, Open on impact? Slow progress in World Bank and IMF Poverty Analysis. European Network on Debt and Development, Brussels.
- Intergovernmental Panel on Climate Change (IPCC), 2008, Climate Change and Water, Technical Paper VI. Geneva: IPCC Secretariat.
- IWMI, 2007, Comprehensive Assessment of Water Management in Agriculture. Water for Food, Water for Life: A Comprehensive Assessment of Water Management in Agriculture. London: Earthscan, and Colombo: International Water Management Institute.
- Jacob J.W., 2002, The Mekong River Commission: Transboundary water resource planning and regional security. *The Geographical Journal*, 168(4).
- Lautze, J., Giordano, M., and Borghese M., 2005, Driving forces behind African transboundary water law: internal, external, and implications, International workshop on 'African Water Laws: Plural Legislative Frameworks for Rural Water Management in Africa', 26-28 January 2005, Johannesburg, South Africa.
- Magrath (2006). Equal access for all? Meeting the needs for water and sanitation of people living with HIV/AIDS. Water Aid Ethiopia Briefing Note 6 January 2006. [online] Available at: http://www.wateraid.org/documents/plugin_documents/hivaid_s_equal_access_...
- Murray-Rust, H., Alpaslan, N., Harmancioglu, N., Svendsen, M. 2003. Growth of Water Conflicts in the Gediz Basin. Turkey. Proceedings ICID 20th European Regional Conference, 14-19 September 2003 Montpellier, France.
- Ngwenya, B.N. and Kgathi, D.L. 2006. HIV/AIDS and access to water: a case study of home-based care in Ngamiland, Botswana. *Physics and Chemistry of the Earth* 31.
- OECD and The World Bank, 2008, Sourcebook: Emerging Good Practices in Managing for Development Results, Third Edition.
- Pearce DW, Atkinson G and Mourato S, 2006, Cost-benefit analysis and the environment: recent developments. Paris: Organization for Economic Cooperation and Development.
- Perret S., Farolfi S., Hassan R., 2006, Water governance for sustainable development, London: Earthscan Ltd.
- Poulos C. and Whittington D., 1999, Special Paper: Individuals' Time Preferences for Life-Saving Programs: Results from Six Less Developed Countries. Singapore: Economy and Environment Program for South East Asia (EEPSEA).

- Rockstrom J., Falkenmark M., Karlberg L., Hoff H., Rost S. and. Gerten D, 2009, Future water availability for global food production: the potential of green water for increasing resilience to global change. *Water Resources Research*, 45, W00A12.
- Roy, A. (1999) *The Cost of Living*, Random House, Inc., New York.
- Russell C., Vaughan W.J, Clark C.D, Rodriguez D.J., Darling A.H, 2001, Investing in water quality: measuring benefits, costs and risks. New York: Inter-American development Bank.
- Rydgren B., Jonsson B. and Saltveit S.J., 2006, HYDROPOWER – environmental impacts, remedial measures and costs in regulated waters. Assessment by the Scientific Review Panel. 16 – 20 January.
- Sagoff M., 2000, Environmental Economics and the Conflation of Value and Benefit, *Environ. Sci. Technol.*, 34 (8), pp 1426–1432
- Schnurr M., 2008, Global Water Governance: Managing complexity on a Global Scale. *Water Politics and Development Cooperation*, Part I, pp. 107-120.
- Sheldon, P. (2005) *Earth's Physical Resources: An Introduction* (Book 1 of S278 *Earth's Physical Resources: Origin, Use and Environmental Impact*), The Open University, Milton Keynes.
- Shrivastava, A.K., 2007. *Environment Monitoring & Evaluation*. New Delhi: APH Publishing Corporation.
- Stuart S.N., 2002, *Environmental Policy and Developing Nations*. Jefferson:McFarland & Company publishers.
- Suen J.P., Eheart W., Herricks E.E., 2005, Integrating Ecological Flow Regimes in Water Resources Management Using Multiobjective Analysis. In *Proceedings: ASCE/EWRI world water and environmental resources congress*, Reston, VA.
- The Environment Agency (EA) in England and Wales, the Scottish Environment Protection Agency (SEPA) in Scotland and the Environment and Heritage Service (EHS) of the Department of the Environment in Northern Ireland.
- Upadyahy B, 2004, Gender roles and multiple uses of water in North Gujarat. Working Paper 70. Colombo, Sri Lanka: International Water Management Institute (IWMI).
- USAID/Hygiene Improvement Project, 2008, Program-ming guidance for integrating water, sanitation and hygi-ene improvement into HIV/AIDS programs. Washington DC US Agency for International Development.
- Vanclay F., 2003, International principles for Social Impact Assessment. *Impact Assessment and Project Appraisal*, 21(1), pp 5-11.
- VanDeveer S.D. and Dabelko G.D. (2001), Its capacity, stupid: international assistance and national implementation, *Global Environmental Politics*, 1(2), 18-29.
- Vivienne B, Dávila-Poblete S., Rico Nieves M., 2005, *Opposing currents: The Politics of Water and Gender in Latin America*. University of Pittsburgh Press.
- WHO, 2001, *Water for Health: Taking Charge*. Geneva: World Health Organization.
- Wolf, A. T. (1999) 'Water wars' and water reality, in S. Lonergan (ed.) *Environmental Change, Adaptation and Security*, Kluwer Academic, Dordrecht, Boston, pp 251-265.

World Bank and Water and Sanitation Programme, 2005, Towards a More Effective Operational Response Arsenic Contamination of Groundwater in South and East Asian Countries. Policy Report No. 31303.

World Bank, 2005, Shaping the future of water for agriculture: a sourcebook for investment in agricultural water management. Washington: World Bank.

World Bank, 2009, Gender in Agriculture Sourcebook, Washington DC: The international Bank for Reconstruction and Development/World Bank.

World Commission on Dams (2000) Dams and Development: A New Framework for Decision-Making, Earthscan, London, [last accessed December 2004].

World Health Organisation (WHO) (1993) Guidelines on Drinking Water Quality, 2nd edition, vol. 1, Recommendations. WHO, Geneva.