Control4Reuse

JPI Water project 2018-2022

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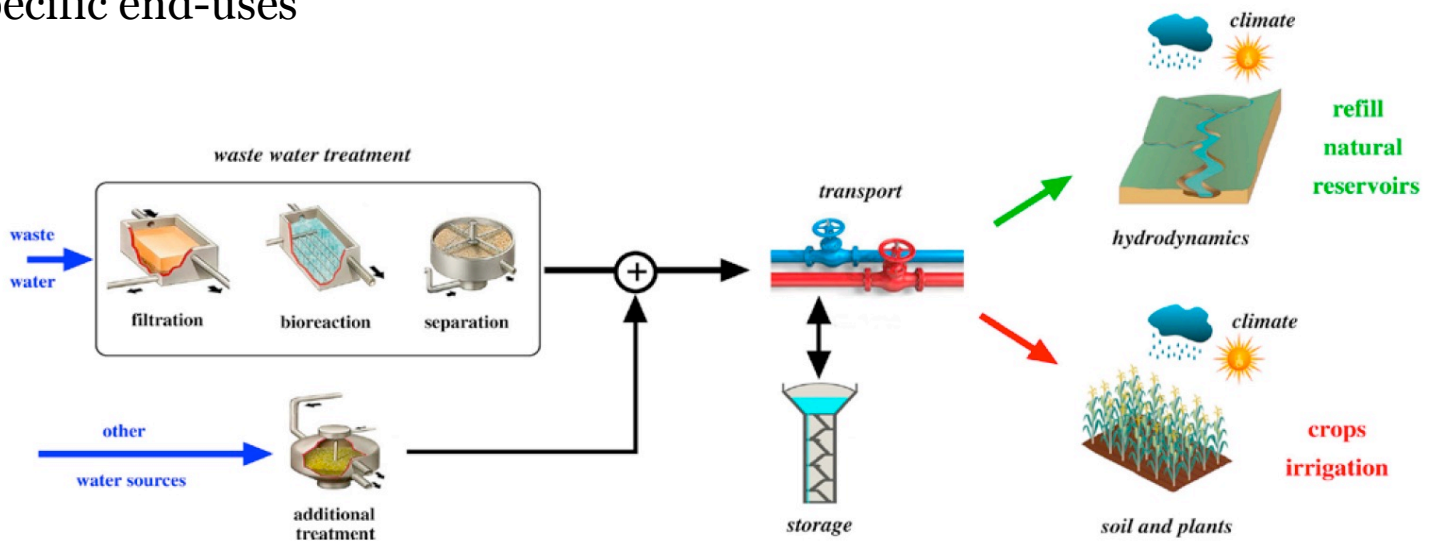
Background

- Water scarcity
- Wastewater reuse
- Today - wastewater treatment and use of water two separate systems

Project Vision

- Integration of wastewater treatment and end-uses
- Treated water not a waste but a resource
- Quality and quantity of treated water can be adjusted to meet requirements of specific end-uses



Partners

Project partners

- Mälardalen University (MDH), Västerås Sweden- project coordinator
- Laboratory of Environmental Biotechnology (LBE) INRA- Narbonne France
- Federal University of Ceará (UFC) –Brazil

Associated partners

- ECOFILAE (private company), France- LBE
- GEAU and IEM (academia, experimental site of Murviel Les Montpellier), France-LBE
- City community of 'Grand Narbonne' (about 130 000 inhabitants), France- LBE
- Water and Wastewater Engineering group of the Aalto University, Finland- UFC
- The Finnish Consulting Group (FCG), Finland- UFC
- Companhia de Água e Sgoto do Ceará) CAGECE, Brazil-UFC

Outputs

- Contribute to the promotion of closed water cycle in society and industry/agriculture
- Evaluation of several scenarios for optimizing water management
- publications of results in international conferences and in peer-reviewed journals
- platform for knowledge exchange among different communities and for stimulating the generation of new and innovative ideas

Objectives

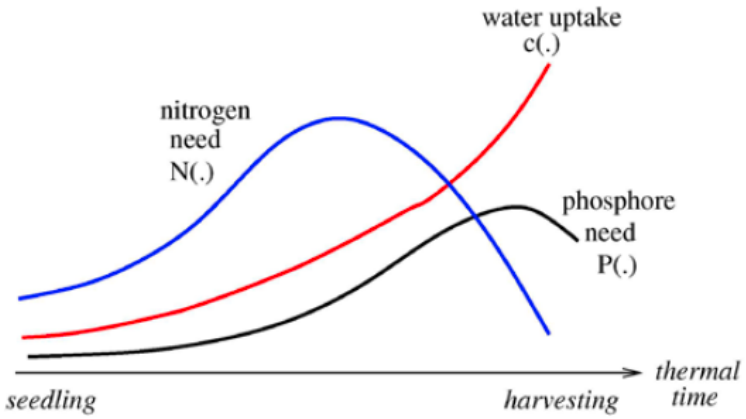
- Objective 1: Characterization of the integrated reuse systems.
- Objective 2: Implementation of a framework for simulation.
- Objective 3: Optimization of the integrated systems.

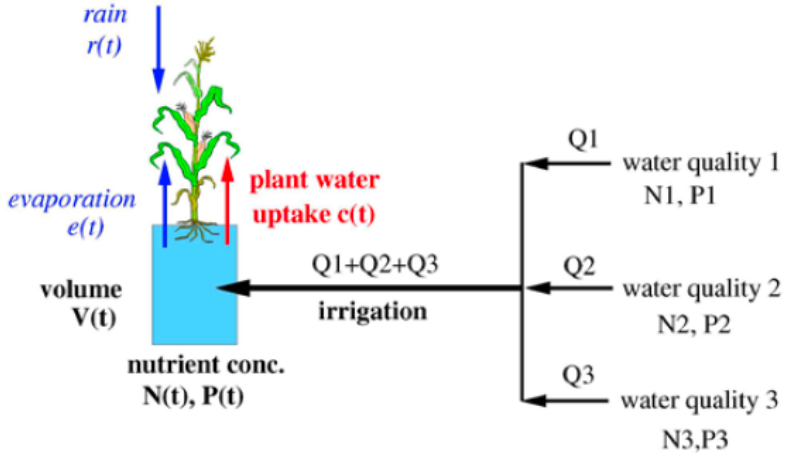
Implementation - Work packages

- WP1: System simulation platforms
- WP2: Optimal estimation and control
- WP3: Fault detection methods and evaluation indexes
- WP4: Implementation/evaluation of control strategies
- WP5: Project management and dissemination

WP1: System simulation platforms

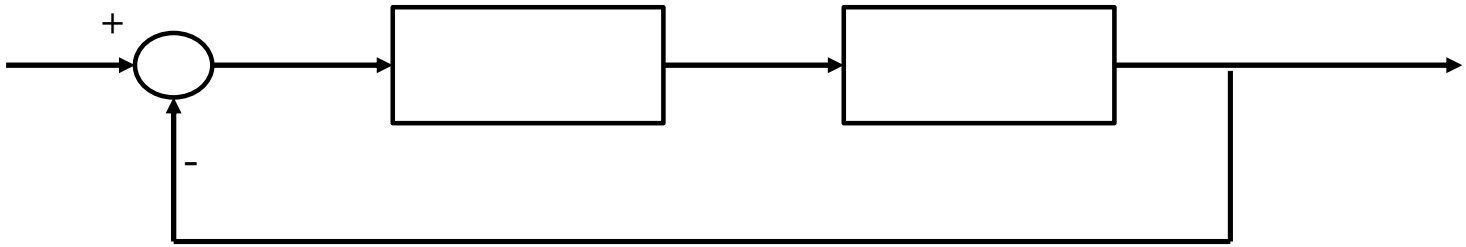
- leader: Laboratory of Environmental Biotechnology (LBE)
- Characterizing the water requirements for reuse
- Selection of models of treatment and plant/culture growth
- Coupling of the models into one simulation platform





WP2: Optimal estimation and control

- leader: Federal University of Ceará (UFC)
- Understanding the dynamics of both treatment and reclamation systems
- Definition of framework for analysis and control of integrated WWT and agriculture reclaiming water systems



WP3: Fault detection methods and evaluation indexes

- leader: Mälardalen University (MDH)
- Introduction of realistic models of system and disturbance uncertainties
- Development of fault detection methods to detect abnormal conditions in the process
- Indexes for controller performance evaluation

WP4: Implementation/evaluation of control strategies

- leader: LBE
- Evaluation of different control strategies
- Full-scale implementation of the simulation platform
- Validation of plant cultivation on experimental sites

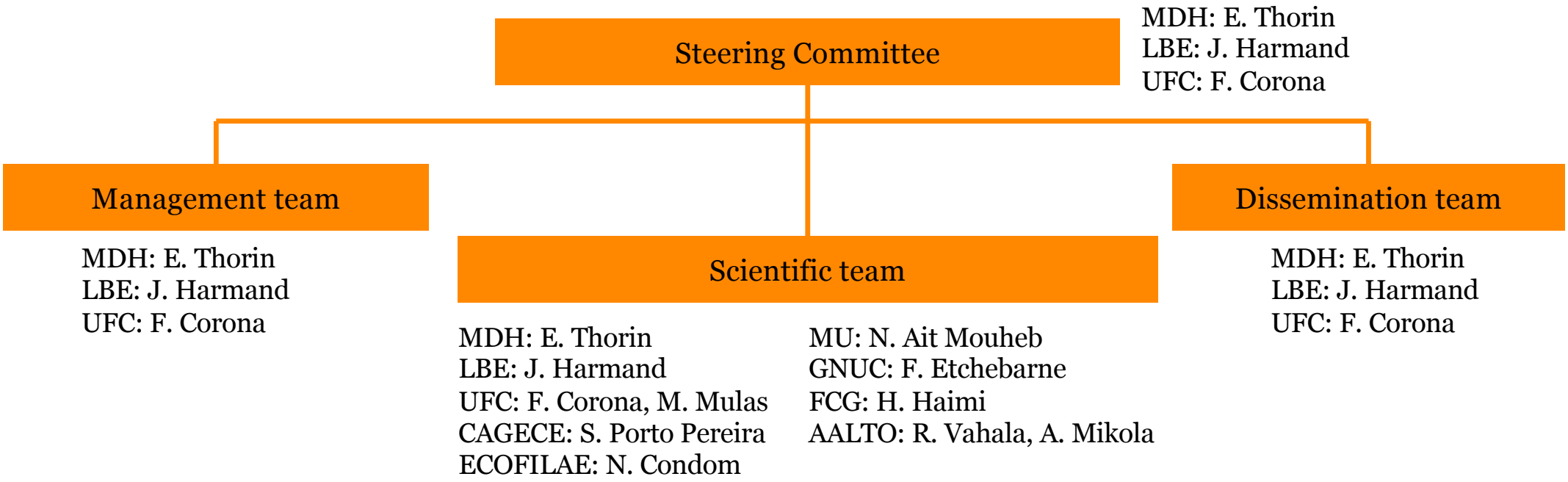
WP5: Project management and dissemination

- leader: MDH
- Project management, monitoring and communication
- Knowledge transfer through conferences, scientific journals and workshops

Implementation- work plan

Month (mX)/ Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Work Package 1																																				
Work Package 2																																				
Work Package 3																																				
Work Package 4																																				
Work Package 5																																				
Milestone	M5.1	M1.1								M1.2 M1.3		M2.1 M3.1				M1.2		M2.2 M3.2		M4.1				M2.3 M3.3								M4.2				M5.2
Deliverable			D1.1									D1.2 D1.3				D3.1		D2.1				D3.2 D4.1		D2.2				D3.3		D2.3					D4.2
Exploitation and communication activities						DA1		DA3				DA1 DA2		DA1				DA1 DA3		DA4				DA1 DA2				DA3		DA1					DA1 DA2 DA3
Risk Management (Task 5.2)																																				

Implementation- Organisation



Activities so far

- First meeting
- Kick-off planned
- PhDs and postdocs in position or on the way (LBE and MDH)
- the experimental site of Murviel Les Montpellier being instrumented