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INOW ASIA

WP1: Preparation

The INOWASIA Consortium

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World University Service of the Mediterranean (WUSMED)	Spain
Institut de Recherche pour le Développement (IRD)	France
Université Paul Sabatier Toulouse III (UPS)	France
Hanoi University of Science – Vietnam National University (HUS)	Vietnam
Can Tho University (CTU)	Vietnam
National University of Laos (NUOL)	Laos
Souphanouvong University (SU)	Laos
Institute of Technology of Cambodia (ITC)	Cambodia
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Abstract

This report compiles the INOWASIA EU partner's expertise on the field of water. For this purpose, a questionnaire (word sheet) has been elaborated by WP1 Leaders (FSUB and NUBB) and completed and validated for the EU partners. The main goal was to gather information on EU partner's expertise and available material for teaching and modules elaboration offer in the field of water. This document present the information acquired in these surveys and covers the following aspects: list of EU INOWASIA partners water related master/PhD programs, a revised list of topics for the INOWASIA formation programs (Basic modules intended as basic online courses and advanced modules intended as Problem Based Learning Courses), expertise on the different water topics and available material that could be useful for the module contents elaboration or training different water topics. This report serves for the following WP2 Task: Develop the learning methodology strategy, Co-design the academic modules and Plan staff mobility for teacher formation.

Document History

Version	Date	Comments
V0.1	05-06-2021	First draft
V0.2	20-11-2021	Final doc

Contents

Acronyms

PC	Partner Country
HEIs	Higher Education Institutions
WP	Work Package

EU INOWASIA partners water related master/PhD programs

The European partners have analysed the experience of their own water or related master's or PhD. The following Table summarises the most relevant degrees/programs for INOWASIA.

Table 1. Summary: EU partners academic offer related to INOWASIA formation program

	UdG	UT3	FSUB
Type of institution	HEI	HEI	University of Barcelona Foundation*
Water science and tech Master	Water Resources Science and Technology	-	Science and Integrated Management of Water
	PBL methodology.- face to face		Classic - face to face
	https://www.udg.edu/en/masters-en-tecnologia/Recursos-Hidrics		https://www.ub.edu/portal/web/earth-sciences/university-master-s-degrees/-/ensenyament/detallEnsenyament/6062786
	60 ECTS - 1 year		120 ECTS -- 2 years
Other Water Related Masters	- Joint Master in Agronomic Engineering - Master in Environmental Change: Analysis and Management	- Process and bioprocess engineering - Functional biology and ecology - Earth and planetary sciences, environment	- Oceanography and Marine Environmental Management - Aquaculture - Ecology, Environmental Management and Restoration
Specific Water PhD Programs	Doctoral Programme in Water Science and Technology https://www.udg.edu/en/estudia/oferta-formativa/programes-de-doctorat/doctorat?IDE=1066&ID=3501302133	-	Aquaculture https://www.ub.edu/portal/web/biologia-es/acuicultura
			Sea Sciences http://www.ub.edu/pdcienciesmar
Other Water Related PhD Programs	- Doctoral Programme in Environment - Doctoral Programme in Chemistry - Doctoral Programme in Technology	- Biology, health and biotechnologies - Ecological, veterinary, agronomic and bioengineering sciences - Universe, environmental and space sciences	- Aquaculture - Ecology, Environmental Sciences and Plant Physiology - Analytical Chemistry and the Environment - Engineering and Applied Sciences

* The Degrees listed are officially from the University of Barcelona

Questionnaire template

Objectives:

- To gather information about INOWASIA EU partner's expertise and available material for teaching and modules elaboration

Target audiences:

- EU INOWASIA partners

Goal:

- 1 reply per EU INOWASIA partner

Questionnaire:

1. **MODULES TOPICS.** In the INOWASIA proposal we have defined specific water modules topics for the INOWASIA formation programs: Basic modules intended as basic online courses and advanced modules intended as Problem Based Learning Courses. **Please add any other module topic you find is really important and missing in others*.**

Water modules
Basic Modules
Water quality
Water and wastewater treatment technologies
Water microbiology
Water management and recycling in small and large water companies
Water monitoring and control
Natural services related to water regulation and provision
Others:*
Advanced modules
Alternative water resources
Management tools-ITCs for water management
General concepts on water sustainable management
Nature based solutions for water management and resilience
Eco-hydrology and ecological engineering
Soil and water dynamics
Water and tourism management
Innovative technologies and new trends on sanitation
Circular economy in the context of water
Water governance and socio-economic aspects in the water field
Water economy and entrepreneurship
Sustainable Water management in agriculture: rural and urban areas
Ecological engineering and water management

Ecosystems services and benefits to people valuation and payment for ecosystem services
Water and smart cities: sustainable water management and smart cities
Others:*

Please feel free to add any comments in regards to the modules topics

2. **MODULES EXPERTISE.** Please mark with a cross (X) in which courses your HEI has expertise and could participate in the module contents elaboration or training and the expertise rank level. Add the name of the experts if possible.

Water modules	**Mark with a cross (X)**	**Expertise level** (0-10) 0:low-10:high	**Expert name/s**
Basic Modules			
Water quality			
Water quality			
Water and wastewater treatment technologies			
Water and wastewater treatment technologies			
Water microbiology			
Water management and recycling in small and large water companies			
Water monitoring and control			
Natural services related to water regulation and provision			
Others:			
Advanced modules			
Alternative water resources			
Management tools-ITCs for water management			
General concepts on water sustainable management			
Nature based solutions for water management and resilience"			
Eco-hydrology and ecological engineering			
Soil and water dynamics			
Water and tourism management			
Innovative technologies and new trends on sanitation			

Circular economy in the context of water			
Water governance and socio-economic aspects in the water field			
Water governance and socio-economic aspects in the water field			
Water economy and entrepreneurship			
Sustainable Water management in agriculture: rural and urban areas			
Ecological engineering and water management			
Ecosystems services and benefits to people valuation and payment for ecosystem services			
Water and smart cities: sustainable water management and smart cities			
Others:			

Please feel free to add any comments in regards to the modules expertise

3. **MODULES MATERIAL. Please mark with a cross (X) in which courses your HEI has some available material that could be useful for the module contents elaboration or training.** In case you have some available material that can be used for INOWASIA specify in which format (eg. Word, Pdf, Pptx., Online, Video...) and language.

Water modules	**Mark with a cross (X)**	**Format**	**Language**
Basic Modules			
Water quality			
Water and wastewater treatment technologies			
Water and wastewater treatment technologies			
Water microbiology			
Water management and recycling in small and large water companies			
Water monitoring and control			
Natural services related to water regulation and provision			
Others:			
Advanced modules			
Alternative water resources			
Management tools-ITCs for water management			
General concepts on water sustainable			

management			
Nature based solutions for water management and resilience”			
Eco-hydrology and ecological engineering			
Soil and water dynamics			
Water and tourism management			
Innovative technologies and new trends on sanitation			
Circular economy in the context of water			
Water governance and socio-economic aspects in the water field			
Water economy and entrepreneurship			
Sustainable Water management in agriculture: rural and urban areas			
Ecological engineering and water management			
Ecosystems services and benefits to people valuation and payment for ecosystem services			
Water and smart cities: sustainable water management and smart cities			
Others			

Please feel free to add any comments in regards to the modules material (eg. copyright/intellectual property issues,…)

Questionnaire Responses: UdG

1. **MODULES TOPICS.** In the INOWASIA proposal we have defined specific water modules topics for the INOWASIA formation programs: Basic modules intended as basic online courses and advanced modules intended as Problem Based Learning Courses. **Please add any other module topic you find is really important and missing in others*.**

Water modules
Basic Modules
Water quality
Water and wastewater treatment technologies
Water microbiology
Water management and recycling in small and large water companies
Water monitoring and control
Natural services related to water regulation and provision
Others:* **Water cycle and water resources balance (Josep Mas, Hidrogeology)**
Advanced modules
Alternative water resources
Management tools-ITCs for water management
General concepts on water sustainable management
Nature based solutions for water management and resilience
Eco-hydrology and ecological engineering
Soil and water dynamics
Water and tourism management
Innovative technologies and new trends on sanitation
Circular economy in the context of water
Water governance and socio-economic aspects in the water field
Water economy and entrepreneurship
Sustainable Water management in agriculture: rural and urban areas
Ecological engineering and water management
Ecosystems services and benefits to people valuation and payment for ecosystem services
Water and smart cities: sustainable water management and smart cities
Others:* - **Ecosystem services: blue and green infrastructure (Nadia Fava, Architecture and urban planning)** - **Forecasting water quality, Impacts of climate change on water quality (Rafa Marcè, ecology ICRA)** - **Wastewater-based epidemiology concepts (including something on sars-cov-2 surveillance in sewage) Lluís Corominas and Carles Borrego (ICRA-UdG)**

Please feel free to add any comments in regards to the modules topics

2. **MODULES EXPERTISE.** Please mark with a cross (X) in which courses your HEI has expertise and could participate in the module contents elaboration or training and the expertise rank level. Add the name of the experts if possible.

Water modules	**Mark with a cross (X)**	**Expertise level** (0-10) 0:low-10:high	**Expert name/s**
Basic Modules			
Water quality	**x**	**10 (groundwater quality, pollutants kind and source, monitoring and control (planning)**	**Josep Mas (hydrogeology)**
Water quality	**x**		**Rafa Marcé (ecology, ICRA**
Water and wastewater treatment technologies	**x**	**7**	**Joan Josep Sunyol y Maria Lluisa Escoda (Phyisics)**
Water and wastewater treatment technologies	**x**	**10**	**LEQUiA-UdG (Chemical Engineering)**
Water microbiology			
Water management and recycling in small and large water companies			
Water monitoring and control	**x**		**Rafa Marcé (ecology, ICRA**
Natural services related to water regulation and provision			
Others:			
Advanced modules			
Alternative water resources			
Management tools-ITCs for water management	**X**		**Josep Pueyo Ros Xavier Garcia Acosta Diego Varga Linde (geography)**

Management tools-ITCs for water management	**X**		**Rafa Marcé (ecology, ICRA)**
General concepts on water sustainable management	**x**	**10 (groundwater dynamics and sustainable exploitation regimes, and impacts derived from groundwater withdrawal)**	**Josep Mas (Hydrogeology)**
Nature based solutions for water management and resilience"			
Eco-hydrology and ecological engineering			
Soil and water dynamics			
Water and tourism management	**X**		**Ariadna Gabarda Mallorquí Anna Ribas Palom Maria Torres Bagur (Geography)**
Innovative technologies and new trends on sanitation			
Circular economy in the context of water			
Water governance and socio-economic aspects in the water field	**X**		**Anna Ribas Palom David Pavón Gamero Albert Llausàs Pascual (Geography)**
Water governance and socio-economic aspects in the water field	**x**	**8**	**Lucia Alexandra Popartan (Iequia, political scientist)**
Water economy and entrepreneurship			
Sustainable Water management in agriculture: rural and urban areas			
Ecological engineering and water management			
Ecosystems services and benefits to people valuation and payment for ecosystem services	**X**		**Enrica Garau Josep Pueyo-Ros (Geography)**
Water and smart cities: sustainable water management and smart cities			
Others: **Forecasting water quality, Impacts of climate change on**			**(Rafa Marcè, ecology ICRA)**

water quality **Wastewater-based epidemiology concepts (including something on sars-cov-2 surveillance in sewage)**	**X** **x**		**Lluis Corominas, Carles Borrego (ICRA-UdG)**

Please feel free to add any comments in regards to the modules expertise

3. **MODULES MATERIAL. Please mark with a cross (X) in which courses your HEI has some available material that could be useful for the module contents elaboration or training.** In case you have some available material that can be used for INOWASIA specify in which format (eg. Word, Pdf, Pptx., Online, Video...) and language.

Water modules	Mark with a cross (X)	Format	Language
Basic Modules			
Water quality	**X (icra)**		**English**
Water and wastewater treatment technologies	**X (physics)**	**Pdf (thesis, articles)**	**French-English**
Water and wastewater treatment technologies	**X (lequia)**	**Ppt, papers**	**English**
Water microbiology			
Water management and recycling in small and large water companies			
Water monitoring and control	**X (icra)**		**English**
Natural services related to water regulation and provision			
Others:			
Advanced modules			
Alternative water resources			
Management tools-ITCs for water management	**X Geography**		**Spanish English**
Management tools-ITCs for water management	**X (icra)**		**English**
General concepts on water sustainable management			
Nature based solutions for water management and resilience"			
Eco-hydrology and ecological engineering			
Soil and water dynamics			
Water and tourism management	**X Geography**		**Spanish French English**
Innovative technologies and new trends			

on sanitation			
Circular economy in the context of water			
Water governance and socio-economic aspects in the water field	**X Geography**		**Spanish English**
Water economy and entrepreneurship			
Sustainable Water management in agriculture: rural and urban areas			
Ecological engineering and water management			
Ecosystems services and benefits to people valuation and payment for ecosystem services	**X Geography**		**Spanish English**
Water and smart cities: sustainable water management and smart cities			
Others: *Forecasting water quality, Impacts of climate change on water quality*	**X (icra)**		**English**

Please feel free to add any comments in regards to the modules material (eg. copyright/intellectual property issues,…)

Questionnaire Responses: UT3

1. **MODULES TOPICS.** In the INOWASIA proposal we have defined specific water modules topics for the INOWASIA formation programs: Basic modules intended as basic online courses and advanced modules intended as Problem Based Learning Courses. **Please add any other module topic you find is really important and missing in others*.**

Water modules
Basic Modules
Water quality
Water and wastewater treatment technologies
Water microbiology
Water management and recycling in small and large water companies
Water monitoring and control
Natural services related to water regulation and provision
Others:* *Basics of Natural aquatic ecosystems and reservoirs functioning (environment characteristics and biota)*
Advanced modules
Alternative water resources
Management tools-ITCs for water management
General concepts on water sustainable management

Nature based solutions for water management and resilience
Eco-hydrology and ecological engineering
Soil and water dynamics
Water and tourism management
Innovative technologies and new trends on sanitation
Circular economy in the context of water
Water governance and socio-economic aspects in the water field
Water economy and entrepreneurship
Sustainable Water management in agriculture: rural and urban areas
Ecological engineering and water management
Ecosystems services and benefits to people valuation and payment for ecosystem services
Water and smart cities: sustainable water management and smart cities
Others:* - *Aquatic habitats conservation : state, trends and policies* - *Natural water resource policies and regulation* - *Water crisis mapping*

Please feel free to add any comments in regards to the modules topics

Also in the list of modules, the natural resources knowledge appears a bit poor compared to management oriented modules. Natural services and based solutions are already included , but this is difficult to approach without background knowledge on the natural resource, the various types of aquatic systems functioning and related biodiversity. We should pay attention to start with a balanced proposal, specially for students that possibly arrive with many various backgrounds.

We want to precise the content of several modules depending on the available time of teaching :

- **Water and wastewater treatment technologies** : drinking water production and waste water treatment (Christel Causserand and Claire Albasi and Marion Alliet - UT3, Expertise level : 10)
- **Management tools-ITCs for water management** : should include sensors development and implementation as well as GIS mapping, remote sensing and numerical tool (time series analysis, and data treatment in general), numerical modelling
- Ecological engineering appears twice, but the one with water management should include : circular economy , life cycle assessment, energy saving

2. **MODULES EXPERTISE.** Please mark with a cross (X) in which courses your HEI has expertise and could participate in the module contents elaboration or training and the expertise rank level. Add the name of the experts if possible.

Water modules	**Mark with a cross**	**Expertise level** (0-10) 0:low-10:high	**Expert name/s**

	(X)		
Basic Modules			
Water quality	x	7	**Laboratoire Génie Chimique** Christel Causserand Marion Alliet Claire Albasi **Laboratoire d'Ecologie fonctionnelle** Magali Gerino
Water and wastewater treatment technologies **(including numerical modelling)**	x	10	**Laboratoire Génie Chimique** Christel Causserand Marion Alliet Claire Albasi
Water microbiology : **natural biofilm autotroph and hetérotrophe**	x	7	**Laboratoire d'Ecologie fonctionnelle** Evelyne Buffan
Water management and recycling in small and large water companies	x	5	**Laboratoire Génie Chimique** Marion Alliet Claire Albasi
Water monitoring and control : **environmental sensors**	x	8	**Laboratoire d'Ecologie fonctionnelle** Arnaud Elger Jean Louis Druilhe
Natural services related to water regulation and provision	x	8	**Laboratoire d'Ecologie fonctionnelle** Magali Gerino Romain Walcker
Others: ***Basics of Natural aquatic ecosystems and reservoirs functioning (environment characteristics and biota)*** *→ Bioindication of water bodie health : IBG MPCE , aquatic vegetation, organic matter degradation (Tea bag test)*	x	10	**Laboratoire d'Ecologie fonctionnelle** Evelyne Buffan Arnaud Elger Magali Gerino
Advanced modules			
Alternative water resources			

Management tools-ITCs for water management : **GIS, remote sensing, SWAT, IoT, numerical network engineering , data treatment**	X	9 -10	Romain Walcker Rahim Kacimi Arnaud Elger
General concepts on water sustainable management			
Nature based solutions for water management and resilience	x	8	**Laboratoire d'Ecologie fonctionnelle** Magali Gerino
Eco-hydrology and ecological engineering	x	8	**Laboratoire d'Ecologie fonctionnelle** Magali Gerino
Soil and water dynamics			
Water and tourism management			
Innovative technologies and new trends on sanitation	x	8	**Laboratoire Génie Chimique** Christel Causserand Claire Albasi Marion Alliet
Circular economy in the context of water			
Water governance and socio-economic aspects in the water field			
Water economy and entrepreneurship			
Sustainable Water management in agriculture: rural and urban areas			
Ecological engineering and water management			
Ecosystems services and benefits to people valuation and payment for ecosystem services	x	5	**Laboratoire d'Ecologie fonctionnelle** Magali Gerino
Water and smart cities: sustainable water management and smart cities			
Others: - Water biodiversity conservation			**Laboratoire d'Ecologie fonctionnelle** Magali Gerino

- *Aquatic habitats conservation : state, trends and policies* - *Natural water resource policies and regulation* - *Water crisis mapping*			

Please feel free to add any comments in regards to the modules expertise

3. **MODULES MATERIAL. Please mark with a cross (X) in which courses your HEI has some available material that could be useful for the module contents elaboration or training.** In case you have some available material that can be used for INOWASIA specify in which format (eg. Word, Pdf, Pptx., Online, Video...) and language.

Water modules	Mark with a cross (X)	Format	Language
Basic Modules			
Water quality	x	data	
Water and wastewater treatment technologies	x	ppt, membrane & water treatment video	
Water microbiology			
Water management and recycling in small and large water companies			
Water monitoring and control			
Natural services related to water regulation and provision			
Others: *Bioindication* *Basics of Natural aquatic ecosystems and reservoirs functioning (environment characteristics and biota)*		ppt and field gear ppt and serious game	english
Advanced modules			
Alternative water resources			
Management tools-ITCs for water management		open source software (QGIS, SWAT, … R studio, Google hearth engine, Data : land uses, water content, climate , ground	

		water	
General concepts on water sustainable management			
Nature based solutions for water management and resilience"			
Eco-hydrology and ecological engineering			
Soil and water dynamics			
Water and tourism management			
Innovative technologies and new trends on sanitation		ppt	
Circular economy in the context of water			
Water governance and socio-economic aspects in the water field			
Water economy and entrepreneurship			
Sustainable Water management in agriculture: rural and urban areas			
Ecological engineering and water management		lectures (ppt), video, trainings	english
Ecosystems services and benefits to people valuation and payment for ecosystem services		lectures (ppt), video, trainings	english
Water and smart cities: sustainable water management and smart cities			
Others: - Water biodiversity conservation - *Aquatic habitats conservation : state, trends and policies* - *Natural water resource policies and regulation* - *Water crisis mapping*			

Please feel free to add any comments in regards to the modules material (eg. copyright/intellectual property issues,…)

Many supports for ecological services, values and trends are available on the IPBES web site

Questionnaire Responses: FSUB

1. **MODULES TOPICS.** In the INOWASIA proposal we have defined specific water modules topics for the INOWASIA formation programs: Basic modules intended as basic online courses and advanced modules intended as Problem Based Learning Courses. **Please add any other module topic you find is really important and missing in others*.**

Water modules
Basic Modules

Water quality
Water and wastewater treatment technologies
Water microbiology
Water management and recycling in small and large water companies
Water monitoring and control
Natural services related to water regulation and provision
Others:* - *Introduction to WASH*
Advanced modules
Alternative water resources
Management tools-ITCs for water management
General concepts on water sustainable management
Nature based solutions for water management and resilience
Eco-hydrology and ecological engineering
Soil and water dynamics
Water and tourism management
Innovative technologies and new trends on sanitation
Circular economy in the context of water
Water governance and socio-economic aspects in the water field
Water economy and entrepreneurship
Sustainable Water management in agriculture: rural and urban areas
Ecological engineering and water management
Ecosystems services and benefits to people valuation and payment for ecosystem services
Water and smart cities: sustainable water management and smart cities
Others:* - *Water and Wastewater technologies management and maintenance* - *Basics on data management (for research and data process)*

Please feel free to add any comments in regards to the modules topics

- *Propositions:*
  1. *Join water quality and water microbiology*
  2. *Join alternative water resources and circular economy*
  3. *Join Nature Based Solutions, ecological engineering and eco-hydrology*

2. **MODULES EXPERTISE.** Please mark with a cross (X) in which courses your HEI has expertise and could participate in the module contents elaboration or training and the expertise rank level. Add the name of the experts if possible.

Water modules	**Mark with a cross (X)**	**Expertise level** (0-10) 0:low-10:high	**Expert name/s**
Basic Modules			

Water quality	x	9-10	Antonina Torrens (FSUB-UB) Montserrat Folch (UB) Josefina Tapias (UB)
Water and wastewater treatment technologies	x	9	Antonina Torrens (FSUB-UB) Montserrat Folch (UB) Miquel Salgot (UB
Water microbiology	x	8	Antonina Torrens (FSUB-UB) Montserrat Folch (UB)
Water management and recycling in small and large water companies			
Water monitoring and control			
Natural services related to water regulation and provision			
Others:			
Advanced modules			
Alternative water resources	x	9	Antonina Torrens (FSUB-UB) Montserrat Folch (UB)
Management tools-ITCs for water management			
General concepts on water sustainable management	x	7	Antonina Torrens (FSUB-UB)
Nature based solutions for water management and resilience	x	9	Antonina Torrens (FSUB-UB)
Eco-hydrology and ecological engineering			
Soil and water dynamics	x	5	Antonina Torrens (FSUB-UB) Montserrat Folch (UB)
Water and tourism management			
Innovative technologies and new trends on sanitation	x	7	Antonina Torrens (FSUB-UB)
Circular economy in the context of water	x	5	Antonina Torrens (FSUB-UB)
Water governance and socio-economic aspects in the water field			
Water economy and entrepreneurship			

Sustainable Water management in agriculture: rural and urban areas			
Ecological engineering and water management			
Ecosystems services and benefits to people valuation and payment for ecosystem services			
Water and smart cities: sustainable water management and smart cities			
Others:			

Please feel free to add any comments in regards to the modules expertise

We can contact with professors of the UB water master if some expertise is missing, but they are officially UB professors not FSUB.

3. **MODULES MATERIAL. Please mark with a cross (X) in which courses your HEI has some available material that could be useful for the module contents elaboration or training.** In case you have some available material that can be used for INOWASIA specify in which format (eg. Word, Pdf, Pptx., Online, Video...) and language.

Water modules	Mark with a cross (X)	Format	Language
Basic Modules			
Water quality	x	Ppt, word	Spanish, French
Water and wastewater treatment technologies	x	Ppt, word	Spanish, French
Water microbiology	x	Ppt, word	Spanish, French
Water management and recycling in small and large water companies			
Water monitoring and control			
Natural services related to water regulation and provision			
Others:			
Advanced modules			
Alternative water resources			
Management tools-ITCs for water management			
General concepts on water sustainable management	x	Ppt, word	Spanish, French
Nature based solutions for water management and resilience"	x	Ppt, word	Spanish, French

Eco-hydrology and ecological engineering			
Soil and water dynamics			
Water and tourism management			
Innovative technologies and new trends on sanitation			
Circular economy in the context of water			
Water governance and socio-economic aspects in the water field			
Water economy and entrepreneurship			
Sustainable Water management in agriculture: rural and urban areas			
Ecological engineering and water management			
Ecosystems services and benefits to people valuation and payment for ecosystem services			
Water and smart cities: sustainable water management and smart cities			
Others: - Introduction to WASH		Ppt, word	French

Please feel free to add any comments in regards to the modules material (eg. copyright/intellectual property issues,…)

Entire course (pdf and ppt) material:

- Sustanaible water management (French)
- NBS for water management (French, Spanish)
- Introduction to wash (French)
- Water quality basics (Spanish, French)

Questionnaire Responses: IRD

1. **MODULES TOPICS.** In the INOWASIA proposal we have defined specific water modules topics for the INOWASIA formation programs: Basic modules intended as basic online courses and advanced modules intended as Problem Based Learning Courses. **Please add any other module topic you find is really important and missing in others*.**

Water modules
Basic Modules
Water quality
Water and wastewater treatment technologies
Water microbiology
Water management and recycling in small and large water companies

Water monitoring and control
Natural services related to water regulation and provision
Others:* *Advanced hydrogeology. To review the main processes and functional properties due to the water cycle at different scales.*
Advanced modules
Alternative water resources
Management tools-ITCs for water management
General concepts on water sustainable management
Nature based solutions for water management and resilience
Eco-hydrology and ecological engineering
Soil and water dynamics
Water and tourism management
Innovative technologies and new trends on sanitation
Circular economy in the context of water
Water governance and socio-economic aspects in the water field
Water economy and entrepreneurship
Sustainable Water management in agriculture: rural and urban areas
Ecological engineering and water management
Ecosystems services and benefits to people valuation and payment for ecosystem services
Water and smart cities: sustainable water management and smart cities
Others:* - *Metrology and environmental observation network*

Please feel free to add any comments in regards to the modules topics

Change some titles: Water and smart cities: sustainable water management and smart cities for Green Cities or Circular Cities. In Green Cities, I like the term to produce greening actions based on water, soil and smart affairs.

In general not enough information on soil dynamics assessment (I don't talk about soil quality assessment). The point is to teach about the soil ecological functions and services. It's a based to discuss on NbS. Alson, to add a missing keyword: Biodiversity

- *We would like to include some presentations in some modules (maybe un soil and water modules).*
    - *« What doe we mean by soil health ? »*
    - *« Biofunctool a field tool to assess soil health, advantage and limit »*
    - *« Impact of tree planation (Rubber tree" on soil biodiversity and soil functioning »*

- *Also introduce hands on teaching to run the Biofunctool.*

2. **MODULES EXPERTISE.** Please mark with a cross (X) in which courses your HEI has expertise and could participate in the module contents elaboration or training and the expertise rank level. Add the name of the experts if possible.

Water modules	**Mark with a cross (X)**	**Expertise level** (0-10) 0:low-10:high	**Expert name/s**
Basic Modules			
Water quality			
Water and wastewater treatment technologies			
Water microbiology			
Water management and recycling in small and large water companies			
Water monitoring and control :			
Natural services related to water regulation and provision			
Others:			
Advanced modules			
Alternative water resources			
Management tools-ITCs for water management :	x	9-10	IRD Sylvain Massuel
General concepts on water sustainable management	x	7	IRD Didier Orange
Nature based solutions for water management and resilience	x	7	IRD Didier Orange
Eco-hydrology and ecological engineering	x	8	IRD Didier Orange
Soil and water dynamics (including soil microbiology, biotools, etc)	x	10	IRD Didier Orange Alain Brauman Claire Marsden
Water and tourism management			
Innovative technologies and new trends on sanitation			
Circular economy in the context of water	x	5	IRD Didier Orange
Water governance and socio-economic aspects in the water field			
Water economy and entrepreneurship			

Sustainable Water management in agriculture: rural and urban areas	x	7	IRD Sylvain Massuel Didier Orange
Ecological engineering and water management	x	7	IRD Didier Orange
Ecosystems services and benefits to people valuation and payment for ecosystem services	x	5	IRD Didier Orange
Water and smart cities: sustainable water management and smart cities	x	3	IRD Claire Marsden
Others: *Metrology and environmental observation network*			IRD Sylvain Massuel

Please feel free to add any comments in regards to the modules expertise

3. **MODULES MATERIAL. Please mark with a cross (X) in which courses your HEI has some available material that could be useful for the module contents elaboration or training.** In case you have some available material that can be used for INOWASIA specify in which format (eg. Word, Pdf, Pptx., Online, Video...) and language.

Water modules	Mark with a cross (X)	Format	Language
Basic Modules			
Water quality			
Water and wastewater treatment technologies			
Water microbiology			
Water management and recycling in small and large water companies			
Water monitoring and control			
Natural services related to water regulation and provision			
Others: *Advanced hydrogeology*	x	ppt	English, French
Advanced modules			
Alternative water resources			
Management tools-ITCs for water management			
General concepts on water sustainable management			
Nature based solutions for water			

management and resilience			
Eco-hydrology and ecological engineering	x	ppt	English, French
Soil and water dynamics	x	ppt	English
Water and tourism management			
Innovative technologies and new trends on sanitation	x	examples	English
Circular economy in the context of water			
Water governance and socio-economic aspects in the water field			
Water economy and entrepreneurship			
Sustainable Water management in agriculture: rural and urban areas			
Ecological engineering and water management			
Ecosystems services and benefits to people valuation and payment for ecosystem services			
Water and smart cities: sustainable water management and smart cities			
Others:			

Please feel free to add any comments in regards to the modules material (eg. copyright/intellectual property issues,…)

Main questionnaire outputs'

- The information obtained through the questionnaires has made it possible to obtain:
  - A revised and upgraded list of modules topics to implement (both basic and advanced)
  - The expertise of the INOWASIA core group of the EU partner institutions and the name of the expert that can teach in each module.
  - The expertise strengthens:
    - water quality
    - water control, modelling
    - sanitation- wastewater (technologies, management, ..)
    - hydrogeology
    - water biodiversity conservation
    - circular economy, water resources recovery, sustainable water management
    - ecological hydrology/engineering, Nature Based Solutions,
    - soil-water
    - IoT, GIS, remote sensing, SWAT, numerical network engineering
    - water-agriculture (soil, water, crops dynamics)
    - mapping
  - The expertise weakness
    - economy and entrepreneurship
    - governance, policies
    - politics, transboundary waters
    - microbiology (tap water)
    - hydraulic/construction (civil related)
    - urban network design/smart
    - water-agriculture (technologies)
  - The need to solve those weaknesses with the expertise of PC institutions (see Deliverable 1.7. Report on local emphasis) and contacting associated partners and other experts of the EU HEIs teaching in the masters and PhD programs described in section 1 of this document.
  - The available teaching material for each model topic, including format and language.
    - Topics: The is some available teaching material for both basic and advanced modules

- Format: most of the teaching supports are power points t presentations, pdf documents but also some videos, website links with data and material, and open source software
- Language: although some teaching material is in English, most of it is in French and Spanish.

➢ This information serves to WP2
  - Activity 2.1. Develop academic content and structure
    - 2.1.2. Develop the learning methodology strategy
    - 2.1.3. Co-design the academic modules
  - Activity 2.2. Teaching methodology establishment
    - 2.2.3. Plan staff mobility for teacher formation