



Workshop report on strategic priorities for curricula development



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1 Summary

1.1 Curricula review (input to T1.2.1):

1 Summary

Partners used the kick-off workshop organised on 18 January 2021 to prioritise their needs on curricula development and improvement of university-enterprise collaboration practices relevant to the Climate Change & Water subject.

The findings of the workshop provide inputs to the surveys and reviews in the other tasks of the WP1. These findings will be also followed up during the final workshop of the WP1 (T1.5.1).

1.1 Curricula review (input to T1.2.1):

- Knowledge on New Technologies for better management of water related to CC.
- Technical and data issues in study processes. Quality of electronic equipment is poor on the student's side.
- Staff training on water and & CC. Increased specialised knowledge on CC and impact on water.
- Participation in courses in countries with advanced knowledge
- Establishment of a course on "Water and climate change". Interdisciplinary courses related CC-Water (social sciences, economics, livelihood, nature/env etc.)- Beyond own comfort zones. The need to include CC in curricula is fairly well understood, but difficulty access local data (lack/paid access)- need research. Increase awareness about CC and impacts, thus the need/interest to include them in curricula will increase.
- Addressing public to climate change and water awareness by the development of material
- Lack of technical infrastructure for electronic learning (for students as well as for teachers). Internet issues - poor network signal quality
- Strengthening of advanced water management tools and practical aspects, which are not covered in open educational resources.
- Explore more effective tools for education (digital tools)
- Textbook material focusing on CC & Water.
- Textbooks are "old fashion" and need an update on modern technologies in WT, WWT, IndWWT, water reclamation.
- Creating a network for a good database of water characteristics (quantity and quality) as a base for education
- Development of e-exams. Lack of possibilities for electronic exams. Prevent misuse during exams (copying via WhatsApp) => increase the strength of E-exams
- E-Courses (support for training of the staff) for distance learning lectures. E-learning is not accepted by all the teachers. Podcasts of ppt-presentation
- Increase the structure and the quality of information accessible for students (YouTube, web, books) to get high-quality information.
- Blended learning (online, presence) will be the future. Upload of students work and evaluation of presentations using zoom.
- Limited use of open-source simulation tools - increasing is intended.
- Strengthen sustainability in the curricula and in the education programmes.
- Lab Works/field work to reflect CC issues- lack of water, political issues, impact of agriculture, livelihood etc.
- Water education is commonly thought as a part of CIVIL/Construction engineering; thus, focus on CC is not really on water - need to increase.
- Interaction between students and teachers
- Access to information on latest/upcoming national/international regulations related to CC; CC related new standards - sharing best practices.
- Using Camtasia software for editing videos and presentations and MS360
- Podcast in Moodle as well as synchronous lectures



1 Summary

1.2 University-enterprise collaboration practices (input to T1.2.2):

- Little specification of the educational system / subjects

1.2 University-enterprise collaboration practices (input to T1.2.2):

- Not enough introduction of the new technologies
- Knowledge on the use of digital Tools (SCADA, IoT, data sharing, Remote Control etc.)
- Strengthening students' projects and engaging different stakeholders by open access
- Monitoring of wastewater treatment facilities
- Students/engineers need more in the instrumentation / modernization for technical.
- How to implement: New lectures, workshops, project reports, collaboration with stakeholders etc.
- Do not have enough skilled persons and difficulties in convincing the end user, sometimes industry partners sometimes farmer (individual)
- Tech skill-focused / management skill lacked.
- Penetrating the new technology, policy dimension, innovation encouragement
- The common unit lacks a link to the tech courses. Management and communication
- Internship with focus on water management, less on design
- Outreach of research results to stakeholders - use New methods.
- Improve CC resilience when retrofitting existing and New concepts are introduced.
- Challenge for authorities to make water available to different sectors.

1.3 Climate-water subject and policies (cross-cutting inputs to the A1.4):

- Stormwater management and floods
- Droughts in Northern China and floods in the central part
- Need to develop open, reliable, QA and dynamic databases related to CC & Water.
- Access to international as well as regional databases with information on water resources
- Development of simulation tools for better understanding of climate change
- How to strengthen the academic interactions focusing on CC
- Cyber Security in the water sector
- Data analysis and decision support system
- Water stress
- Ground water depletion
- Intrusion of seawater
- Innovative/modern water conservation aspects
- Change of rainfall patterns/Seasons impacting farming practices - Food Security etc. Impact on agriculture. Water distribution/water quality conflict in SL for agro-aliment
- Reduce pollution loads induced by CC to surface waters.
- Extreme hydrological events (flash floods, droughts)
- Water rights under increasing demands (under political threats, CC)
- Need to increase knowledge/consideration on CC impacts on water quantities in the South and new user patterns especially in water transfer projects.
- Pollution during long range transfers during intermediate storage/distribution etc.
- Problems with water management
- Groundwater pollution
- New challenges due to change of rainfall/lack of rain patterns.
- Stormwater management. Regional problems with precipitation distribution
- Water transport



1 Summary

1.3 Climate-water subject and policies (cross-cutting inputs to the A1.4):

- General CC focus is on water quantity but need to address quality too. Impact of CC on water quantity (reduction) challenging the pastures.
- Impact on traditional IWRM by CC - to integrate impacts and management approaches.
- Wastewater treatment (not efficient purification)
- Land degradation and erosions
- From pure hydrological to socio-hydrological approaches
- Coastal and marine problems
- Effluents from WW for water in big cities
- Seasonal availability of water
- Adaption action plans in Germany (water cluster)



2 Methodology

2.1 Workshop goals

- We want better to understand at university, country, region levels:
- General needs in new curriculum or upgrades
- Which practices can be cross reviewed?
- What should be the vectors outside consortium?
- Policy issues
- Outcomes of this workshop will help to shape the tasks in the WP1:
- Cross-reviews
- Review of best practices
- Policy review

2.2 Working questions

1. What is the Climate Change challenges & adaptation needs in the water sector of your country?
2. Which knowledge domains should be updated in the water sector of your country?
3. What are the skills mismatch and expectations in the water sector of your country?
4. What are the challenges related to digital readiness of water education in your country?

2.3 Role of the moderators

- To guide the conversation and keep participants on track of the topic and time.
- To write down the points in Group Map during the conversation.

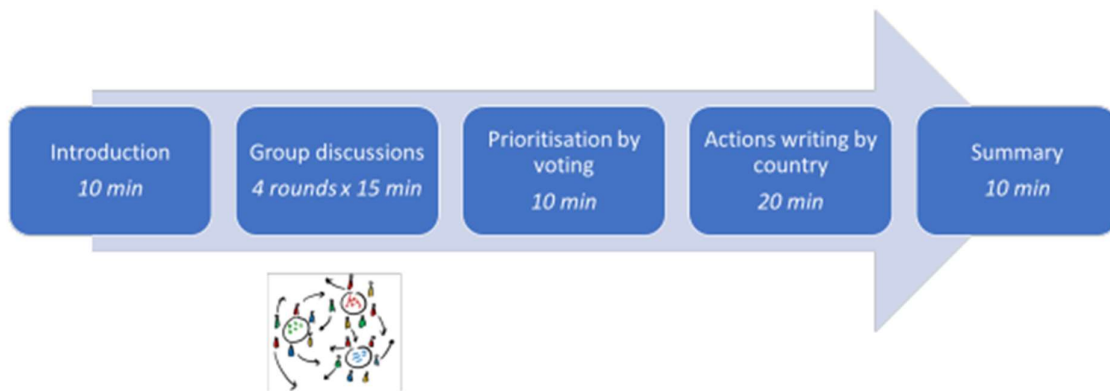
Focus	Break-out rooms	Moderator
1 Climate Change challenges & adaption needs in the water sector	Climate Change	Katarzyna
2 Relevant and updated knowledge in the water sector	Knowledge	Harsha
3 Skills mismatch and expectations in the water sector	Skills	Qiran
4 Digital readiness of water education	Readiness	Martin



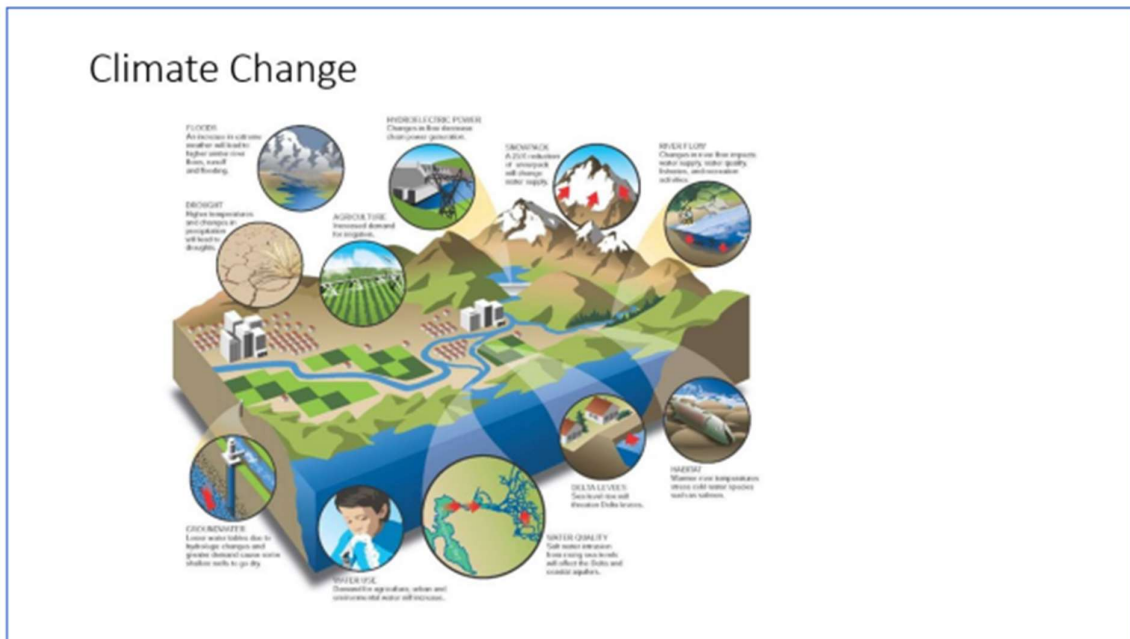
2 Methodology

2.4 Workshop structure

2.4 Workshop structure



2.5 Introductory notes



Some trends of Human Capital in the water sector

KNOWLEDGE: new specialisations are appearing (*digital, circular economy etc.*)
→ need for relevant and updated knowledge through **study programs** in higher education and research, connecting learning with practice

Agendas
Responding to global water challenges, IWA progressive agendas support sustainable urban and basin-related water solutions.

DIGITAL WATER **WATER AND SANITATION SERVICES** **CITIES OF THE FUTURE** **BASINS OF THE FUTURE**

Credit: iwa-network.org

Some trends of Human Capital in the water sector

SKILLS: skilled labour > unskilled labour

- Automation in water sector displaces unskilled labour that is being released for advanced training to skilled level → need for **Reskilling programs**
- Innovations in water sector bring new equipment and materials → need for **Lifelong Learning programs (training)** and independent **professional certification**
- Waves in economy **release labour** from various engineering sectors that can be attracted to water sector → need for **sectoral talent attraction strategy** (*raising water sector attractiveness*)

Many organizations currently use various automation technologies

Please indicate how extensively your organization is using each type of automation today.



Note: Percentages may not total 100 percent due to rounding.
Source: Deloitte Global Human Capital Trends survey, 2019

Many organizations are increasing investments in reskilling their workforce

What additional investment are you anticipating to accommodate workforce reskilling?



Note: Only respondents who said that automation would require reskilling of their organizations answered this question.
Source: Deloitte Global Human Capital Trends survey, 2019

Digital readiness of water education



3 List of participants

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Appendix

China	Sri Lanka
Droughts in Northern China and floods in the central part 8 <small>№ 1</small>	Technical and data issues 12 <small>№ 8</small>
Establishment of a course on "Water and climate change" 7 <small>№ 2</small>	Participation in courses in countries with advanced knowledge 11 <small>№ 7</small>
Not enough introduction of the new technologies 7 <small>№ 1</small>	Stormwater management and floods 10 <small>№ 10</small>
Textbooks are "old fashion" and need an update on modern technologies in WT, WWT, IndWWT, water reclamation 5 <small>№</small>	Addressing public to climate change and water awareness by the development of material 7 <small>№ 8</small>
Water transport 3 <small>№</small>	Access to international as well as regional databases with information on water resources 6 <small>№</small>
Need to increase knowledge/consideration on CC impacts on water quantities in the South and new user patterns especially in water transfer projects 3 <small>№</small>	Lack of technical infrastructure for electronic learning (for students as well as for teachers) 6 <small>№</small>
Pollution during long range transfers during intermediate storage/distribution etc 3 <small>№</small>	Strengthening of advanced water management tools and practical aspects, which are not covered in open educational resources 6 <small>№</small>
Internship with focus on water management, less on design 3 <small>№</small>	Creating a network for a good database of water characteristics (quantity and quality) as a base for education 5 <small>№</small>
E-learning is not accepted by all the teachers 3 <small>№</small>	Strengthening students projects and engaging different stakeholders by open access 4 <small>№</small>
	Development of e-exams in progress 4 <small>№</small>
	Monitoring of wastewater treatment facilities 4 <small>№</small>
	Ground water depletion 4 <small>№</small>
	Improve education 4 <small>№</small>
	Students/engineers need more in the instrumentation / modernization for technical 4 <small>№</small>
	Intrusion of seawater 4 <small>№</small>



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2.5 Introductory notes

Change of rainfall patterns/Seasons impacting farming practices - Food Security etc	4	☞
Impact on agriculture	4	☞
Do not have enough skilled persons and difficulties in convincing the end user, some times industry partners some times farmer (individual)	4	☞
Water rights under increasing demands (under political threats, CC)	4	☞
Blended learning is seen as a possibility for future learning	3	☞
Tech skill-focused / management skill lacked	3	☞
Problems with water management	3	☞
Groundwater pollution	3	☞
Penetrating the new technology, policy dimension, innovation encouragement	3	☞
Regional problems with precipitation distribution	2	☞
Internet issues - poor network signal quality	2	☞
Water distribution/water quality conflict in SL for agro-aliment	2	☞
Extreme weather events	2	☞
More water for health	1	☞
Strengthen sustainability in the curricula and in the education programmes	1	☞
From pure hydrological to socio-hydrological approaches	1	☞
UP: using learning platform moodle and zoom	1	☞
Effluents from WW for water in big cities		☞
Challenge for authorities to make water available to different sectors		☞
Water quantity problems especially near cities		☞
Using Camtasia software for editing videos and presentations and MS360		☞
Food security could be a problem		☞
Prevent misuse during exams (copying via whatsapp) => increase the strength of E-exams		☞
Quality of electronic equipment is poor on the students side		☞

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2.5 Introductory notes

	Podcast in moodle as well as synchronous lectures	<input type="radio"/>	14
	Seasonal availability of water	<input type="radio"/>	14
	Upload of students work and evaluation of presentations using zoom	<input type="radio"/>	14
	Elearning not available for all staff members	<input type="radio"/>	14
Mongolia			
	Establishment of a course on "Water and climate change"	<input checked="" type="radio"/>	7 14
	Explore more effective tools for education (digital tools)	<input checked="" type="radio"/>	6 14
	Data analysis and decision support system	<input checked="" type="radio"/>	5 14
	E-Courses (support for training of the staff) for distance learning lectures	<input checked="" type="radio"/>	4 14
	Water stress	<input checked="" type="radio"/>	4 14
	Limited use of open-source simulation tools - increasing is intended	<input checked="" type="radio"/>	3 14
	The common unit lacks a link to the tech courses. Management and communication	<input checked="" type="radio"/>	3 14
	Waste water treatment (not efficient purification)	<input checked="" type="radio"/>	2 14
	Impact of CC on water quantity (reduction) challenging the pastures	<input checked="" type="radio"/>	2 14
	Land degradation and erosions	<input checked="" type="radio"/>	2 14
	Impact on agriculture, livestock	<input checked="" type="radio"/>	2 14
	Temporal and spatial changes of water	<input checked="" type="radio"/>	1 14
	Short experience on online-courses	<input checked="" type="radio"/>	1 14
	Interaction between students and teachers	<input checked="" type="radio"/>	1 14
	Little specification of the educational system / subjects	<input type="radio"/>	0 14
	Courses using teams/online	<input type="radio"/>	0 14
	Podcasts of ppt-presentation	<input type="radio"/>	0 14
International / regional			
	Knowledge on New Technologies for better management of water related to CC	<input checked="" type="radio"/>	14 14
	Staff training on water and & CC	<input checked="" type="radio"/>	12 14
	Need to develop open, reliable, QA and dynamic databases related to CC & Water	<input checked="" type="radio"/>	7 14
	Knowledge on the use of digital Tools (SCADA, IoT, data shareing, Remote Control etc)	<input checked="" type="radio"/>	7 14
	Interdisiplinary courses related CC-Water (social sciences, economics, livelihood, nature/env etc)- og Beyond own comfort zones	<input checked="" type="radio"/>	6 14
	Textbook material focusing on CC & Water	<input checked="" type="radio"/>	6 14
	Development of simulation tools for better understanding of climate change	<input checked="" type="radio"/>	6 14
	How to strengthen the academic interactions focusing on CC	<input checked="" type="radio"/>	6 14
	Cyber Security in the water sector	<input checked="" type="radio"/>	6 14
	Innovative/modern water conservation aspects	<input checked="" type="radio"/>	4 14
	Increase the structure and the quality of information accessible for students (youtube, web, books) to get high-quality information	<input checked="" type="radio"/>	4 14
	Blended learning (online, presence) will be the future	<input checked="" type="radio"/>	4 14

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2.5 Introductory notes

	How to implement: New lectures, workshops, project reports, collaboration with stakeholders etc	4	PI
	Ground water depletion induced by CC	4	PI
	Reduce pollution loads induced by CC to surface waters	4	PI
	Extreme hydrological events (flash floods, droughts)	4	PI
	New challenges due to change of rainfall/lack of rain patterns	3	PI
	Stormwater management	3	PI
	General CC focus is on water quantity but need to address quality too.	2	PI
	Outreach of reserach results to stakeholders - use New methods	2	PI
	Increased specailised knowledge on CC and impact on water	2	PI
	Impact on traditional IWRM by CC - to integrate impacts and mgmt approaches	2	PI
	Improve CC resilience when retrofitting existing and New concepts are introduced	1	PI
	In eastern Europe more frequent water stress and floods	1	PI
	Lab Works/field work to reflect CC issues- lack of water, political issues, impact of agriculture, livelihood etc	1	PI
	Water education is commonly thought as a part of CIVIL/Construction engeering, thus Focus on CC is not realy on water. need to increase	1	PI
	Nuclear problem- cooling	1	PI
	Lack of possibilities for electronic exams	1	PI
	Access to information on latest/upcoming national/international regulations related to CC;CC related new standards - sharing best practices	1	PI
	Coastal and marine problems	1	PI
	The need to include CC in curricula is fairly well understood, but difficulty access local data (lack/paid access)- need research		PI
	Water transport during low water stages		PI

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2.5 Introductory notes

	Increase awareness about CC and impacts, thus the need/interest to include them in curricula will increase	<input type="radio"/>	FR
	Water deficit in eastern Germany; water shortage in rivers	<input type="radio"/>	FR
	Adaption action plans in Germany (water cluster)	<input type="radio"/>	FR

