

# Graduates for Climate Change adapted water management – CC Water

Уур амьсгалын өөрчлөлтөд дасан  
зохицсон усны менежментийн ахисан  
түвшний сургалт

Funded by Erasmus+ Capacity Building in the field of Higher  
Education Programme (Trans-European Cooperation Scheme for Higher Education)

No: 619456-EPP-1-2020-1-NO-EPPKA2-CBHE-JP

**619456-EPP-1-2020-1-NO-EPPKA2-CBHE-JP**

# Агуулга

- Төслийн танилцуулга
- Төслийн оролцогчид, гишүүд
- Төслийн зорилго
- Төслийн аргачлал, арга зүй
- Болж өнгөрсөн үйл явдлууд
- Тулгарч буй бэрхшээл, шийдэл
- Хүлээгдэж буй үр дүн



## Application Form

Selection: 2020

KA2 – Cooperation for innovation and the exchange of good practices – Capacity Building in the field of Higher Education

Call for Proposals 2020 - EAC/A02/2019

Graduates for Climate Change adapted water management  
/CCWater

DETAILED DESCRIPTION OF THE PROJECT

JOINT PROJECTS



EUROPEAN COMMISSION

Education, Audiovisual and Culture Executive Agency

Ref. Ares(2020)4045248 - 31/07/2020

Erasmus+: Higher Education - International Capacity Building

Brussels,  
EACEA.A.4/ARES(2020)

Baardsen Sjur  
NORGES MILJO-OG BIOVITENSKAPLIGE  
UNIVERSITET  
UNIVERSITETSTUNET 3  
AS  
NO - 1433

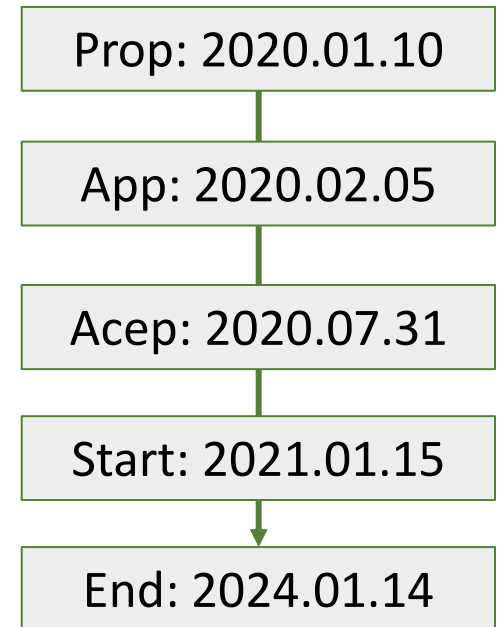
Programme	EPPKA2 - Cooperation for innovation and the exchange of good practices
Action	CBHE-JP - Capacity Building in higher education - Joint Projects
Proposal	Call for Proposals 2020 - EAC-A02-2019-CBHE
Application No	619456-EPP-1-2020-1-NO-EPPKA2-CBHE-JP
Title	Graduates for Climate Change adapted water management
Decision	ACCEPTED

# Төслийн товч танилцуулга

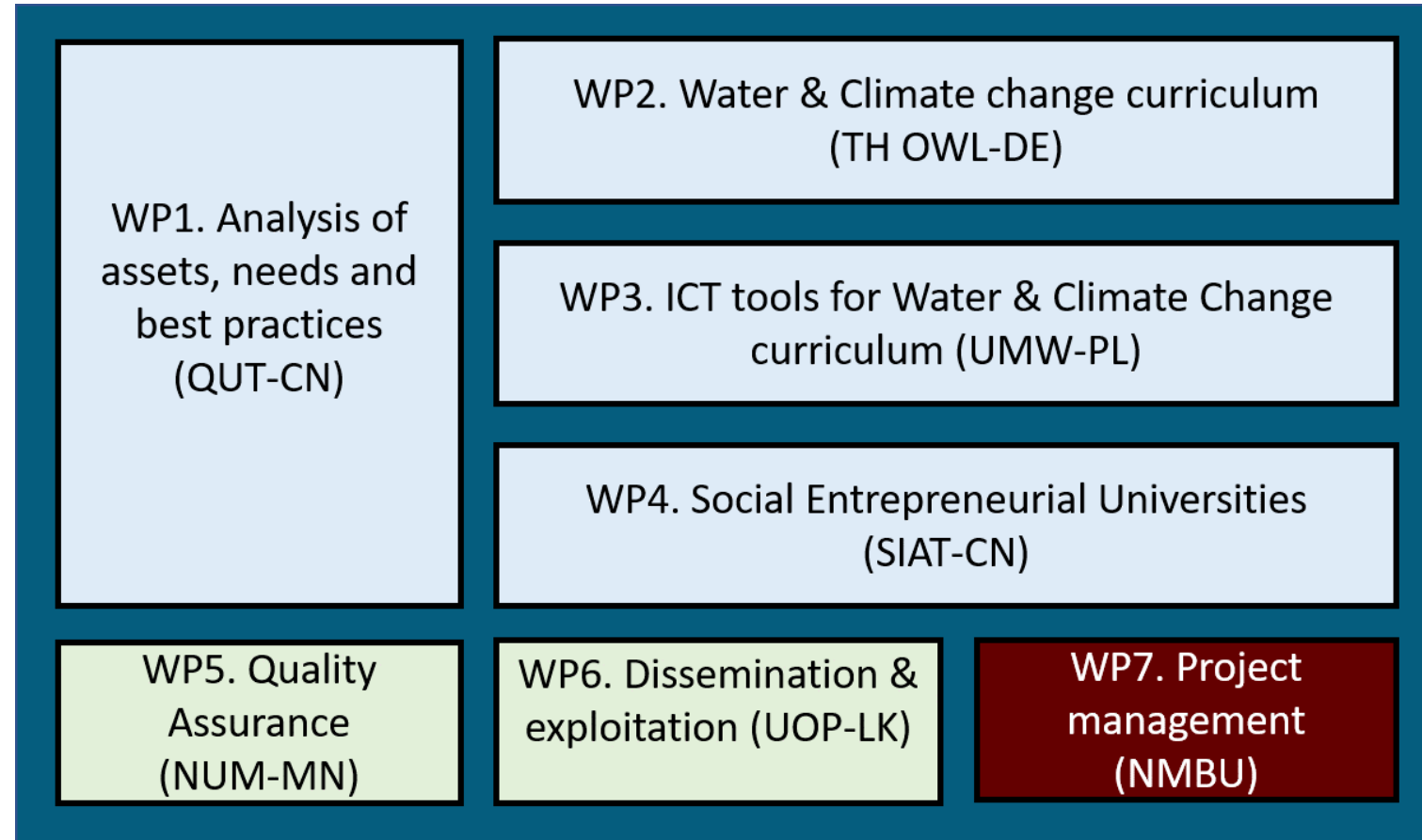
Орчин үеийн инженерийн дэвшилтэт технологи, үр ашигтай заах аргазүйг анхаарч 6 гишүүн орны устай холбоотой дээд боловсролын хөтөлбөрийг сайжруулна. Сайжруулахдаа:

- **CLIMATE RESILIENCE AND SUSTAINABILITY** - Enhance climate resilience and sustainability of water resources and infrastructures in the Partner Countries
- **WATER-RELATED HIGHER EDUCATION** - Modernize water-related higher education with climate change issues and internationalize HEIs from the Partner Countries
- **COMPETENCIES AND SKILLS** - Improve the level of competencies and skills in HEIs from the Partner Countries
- **RELATIONS OF HEIS** - Strengthen relations of HEIs in the Partner Countries with the wider economic and social environment, and enhance their innovation capacity.
- **DIVERSITY AND INCLUSION** - Improve diversity and inclusion of higher education in the Partner Countries

Цаг хугацааны  
тойм  
(1005 - 164)



Organisation Name	City	Country
NORGES MILJO-OG BIOVITENSKAPLIGE UNIVERSITET	AS	Norway
UNIwersytet Warmiński w Olsztynie	OLSZTYN	Poland
TECHNISCHE HOCHSCHULE OSTWESTFALEN-LIPPE	LEMGO	Germany
UNIVERSITY OF PERADENIYA	PERADENIYA	Sri Lanka
RAJA RATA UNIVERSITY OF SRI LANKA	MIHINTALE	Sri Lanka
South Eastern University of Sri Lanka	Oluvil	Sri Lanka
MONGOLIAN UNIVERSITY OF SCIENCE AND TECHNOLOGY	ULAANBAATAR	Mongolia
NATIONAL UNIVERSITY OF MONGOLIA	ULAANBAATAR	Mongolia
QINGDAO TECHNOLOGICAL UNIVERSITY	QINGDAO	China (People's Republic of)
SHENZHEN INSTITUTES OF ADVANCED TECHNOLOGY - CHINESE ACADEMY OF	SHENZHEN	China (People's Republic of)
Inner Mongolia University of Finance and Economics	Hohhot	China (People's Republic of)



Нийт санхүүжилт: 1 сая евро (3.3 тэр бум ₮)

ШУТИС - 69 815 евро (232 сая ₮), үүнээс лаб төхөөрөмж: 26 500 (88.3 сая ₮), Томилот 26 380 (87.9 сая ₮), цалин ба бусад 16935 (56.4 сая ₮)

Мэдээллийг: <https://waterharmony.net/ccwater/>

# Төслийн оролцогчид, гишүүд

**Potential supporter:** AC and QA of SCEA and MUST  
Academic and student affairs of MUST  
Research and cooperation affairs of MUST



Ayurzana Badarch  
Lecturer, School of Civil  
engineering and  
Architecture

**Project manager**

Water resource  
engineering, Numerical  
modeling



Ochirbat Baatar  
President, MUST

**Project mentor**

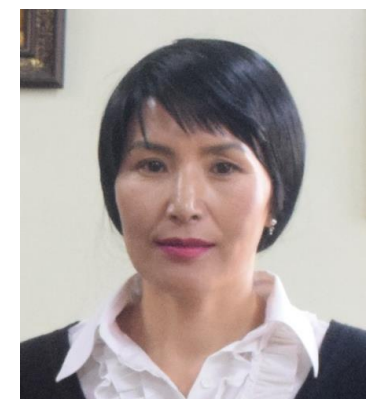
Higher education studies,  
Computer science



Nasanbayar Narantsogt  
Senior lecturer, School of  
Civil engineering and  
Architecture

**Project staff**

Groundwater research,  
hydraulic engineering



Baasansuren Sandir  
Senior lecturer, School of  
Civil engineering and  
Architecture

**Project staff**

Hydrology, water  
governance

**Other staff and assistant:** Boldbaatar Nyamjav (Lecturer) and Suuntsatsal Dovdon (Lecturer)

# Төслийн хүрэх зорилго

What new courses will the project implement in your HEI?

- Big Data for integrated Climate Change & Water management
- Best practices of water resources allocation and water governance

Төслийн том зорилго

Бидний нэмэлт зорилго

For each course please fill the following nested table:

<b>Title</b>	Big Data for integrated Climate Change & Water management
Level of study	Master
List of subjects and credits (ECTS or comparable credit system) for each of them	16 hours of lecture = 2 credits 16 hours of practice = 1 credits
Estimated date of accreditation and accreditation body	-
Estimated starting date of the new programme	Spring of 2021
Number of students to be accepted in the first year/ second year	4 / 4
Number of teaching staff to be trained	2
Internship /placements (if applicable)	None
List of equipment to be purchased for this course? (if applicable)	None

<b>Title</b>	Best practices of water resources allocation and water governance
Level of study	Master
List of subjects and credits (ECTS or comparable credit system) for each of them	16 hours of lecture = 2 credits 16 hours of practice = 1 credits
Estimated date of accreditation and accreditation body	2022 / Mongolian National Council for education Accreditation
Estimated starting date of the new programme	Spring of 2021
Number of students to be accepted in the first year/ second year	4 / 4
Number of teaching staff to be trained	2
Internship /placements (if applicable)	None
List of equipment to be purchased for this course? (if applicable)	None

Усны ахисан түвшний гурван хичээлийн хөтөлбөр, сургалтын материал, сурах бичиг боловсруулж, лабораторын сайжруулалт хийж, багшлах боловсон хүчнийг чадавхижуулж, хамтарсан судалгааг өргөжүүлнэ.

Төсөл хэрэгжүүлэгч дээр Европын холбооны төлөөлөгч гэдгийг оруулсан.

# Төслийн хүрэх зорилго

## For updated courses

Which existing courses will be updated in your HEI?	<ul style="list-style-type: none"> <li>A.WE302 Water purification technology</li> <li>A.WE732 Environmental hydraulics</li> <li>A.WE739 Research seminars on water resources</li> </ul>
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For each course please fill the following nested table:

<b>Title</b>	A.WE302 Water purification technology
Level of study	Bachelor
List of subjects and credits (ECTS or comparable credit system) for each of them	16 hours of lecturer = 2 credits 16 hours of practice = 1 credits
Estimated date of accreditation and accreditation body	2021 / Mongolian National Council for education Accreditation
% of the modernised subjects compared to total subjects included in the course	> 20 %
Number of students to be accepted in the first year/ second year	40 / 40
Number of teaching staff to be trained	1
Internship /placements (if applicable)	-
List of equipment to be purchased for this course? (if applicable)	<ul style="list-style-type: none"> <li>Portable water quality testing package</li> </ul>

Бакалаврын хичээл

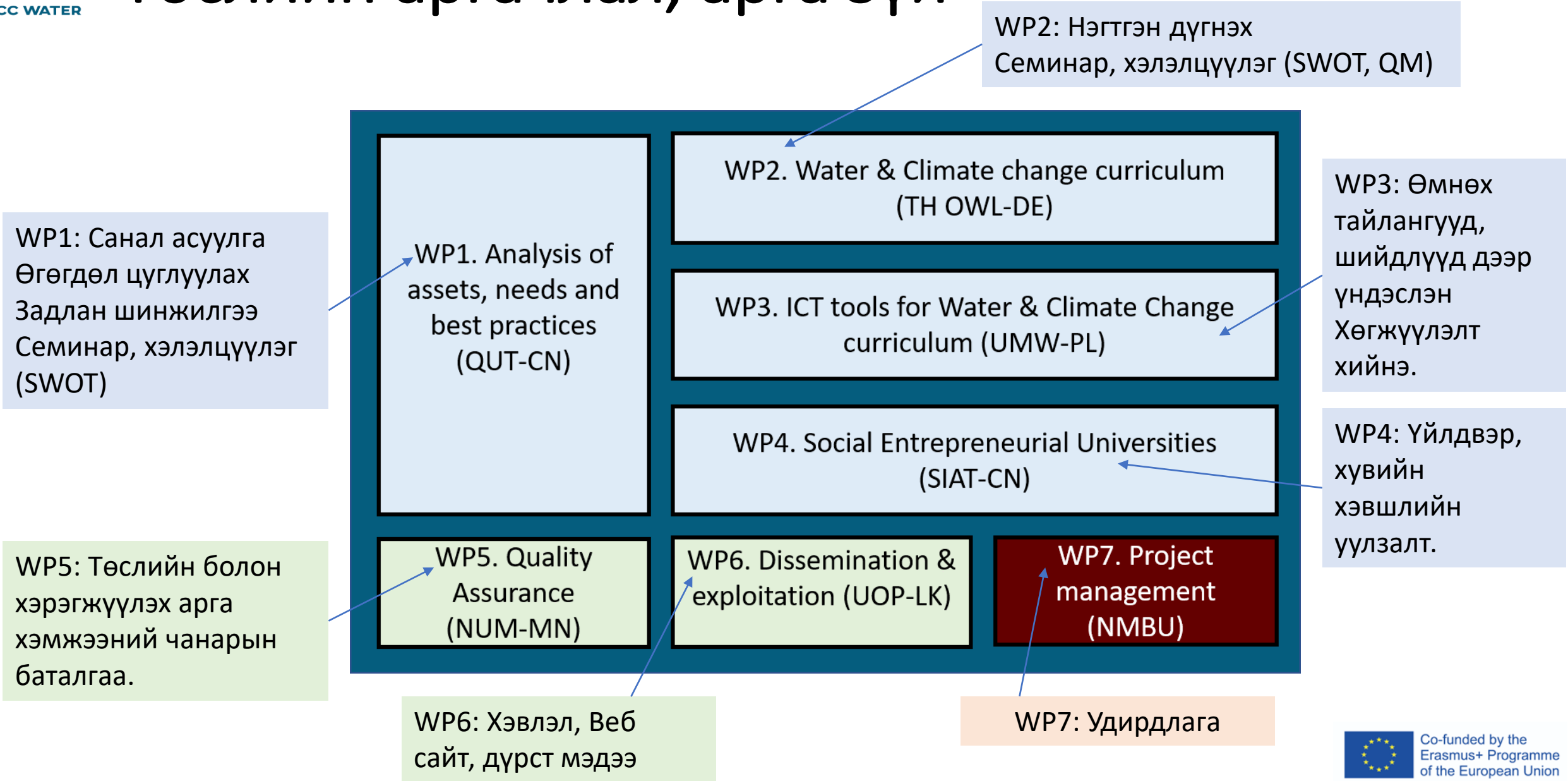
<b>Title</b>	A.WE732 Environmental hydraulics
Level of study	Master
List of subjects and credits (ECTS or comparable credit system) for each of them	16 hours of lecturer = 2 credits 16 hours of practice = 1 credits
Estimated date of accreditation and accreditation body	2022 / Mongolian National Council for education Accreditation
% of the modernised subjects compared to total subjects included in the course	> 20 %
Number of students to be accepted in the first year/ second year	4 / 4
Number of teaching staff to be trained	1
Internship /placements (if applicable)	-
List of equipment to be purchased for this course? (if applicable)	<ul style="list-style-type: none"> <li>Flo-mate velocity meter</li> <li>Bathymetry survey tool</li> </ul>

<b>Title</b>	A.WE739 Research seminars on water resources
Level of study	Master
List of subjects and credits (ECTS or comparable credit system) for each of them	16 hours of seminar = 2 credits
Estimated date of accreditation and accreditation body	2022 / Mongolian National Council for education Accreditation
% of the modernised subjects compared to total subjects included in the course	> 20 %
Number of students to be accepted in the first year/ second year	4 / 4
Number of teaching staff to be trained	1
Internship /placements (if applicable)	-
List of equipment to be purchased for this course? (if applicable)	-

Магистрын хичээл

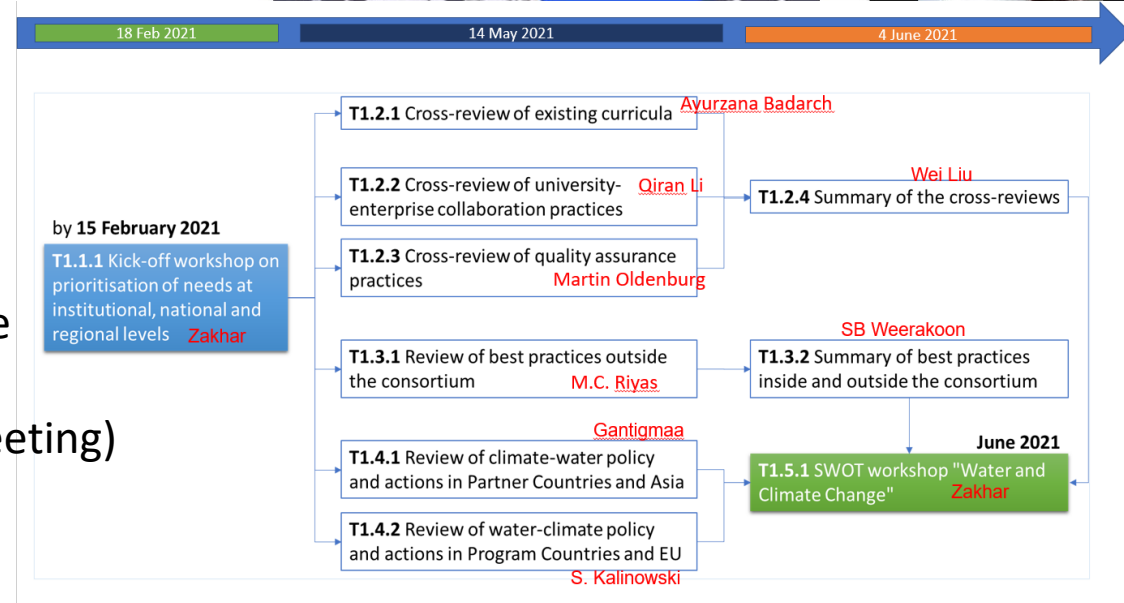
# Төслийн аргачлал, арга зүй





# 2021 онд болж өнгөрсөн үйл явдлууд

- 2021 оны 1 сарын 18 – Төсөл эхлүүлэх уулзалт (Zoom meeting)
- 2021 оны 1 сарын 27 – Төслийн тодруулга уулзалт (Zoom meeting)
- 2021 оны 2 сарын 5 – WP1 Менежерүүдийн уулзалт (MS Teams)
- 2021 оны 2/8 – 2/15 – WP1 Ажлын хуваарилалт (Doodle)
- 2021 оны 2 сарын 24 – WP1 Асуудлуудыг эрэмбэлэх хэлэлцүүлэг (Zoom meeting)
- 2021 оны 3 сарын 5 – Харилцаа, файл дамжуулах механизм (MS Teams, CC Water cloud, emails)
- 2021 оны 3/5 – 5/1 – WP1 өгөгдөл цуглуулах, санал асуулга авах, тайлангуудтай танилцах, задлан шинжлэх, боловсруулалт хийх, тайлан бичих
- 2021 оны 6 сарын 8 – WP1 явцын уулзалт (Zoom meeting)
- 2021 оны 6/8 – 6/29 – WP1 тайлан нэгтгэх
- 2021 оны 6 сарын 30 – WP1 тайлангийн уулзалт
- 2021 оны 6/30 – 9/15 – WP1 тайлан эцэслэх, Амралт
- 2021 оны 9 сарын 15 – WP1 SWOT workshop “Water and Climate change” (Zoom meeting)
- 2021 оны 9 сарын 28 - WP1 Менежерүүдийн уулзалт (Zoom meeting)
- 2021 оны 9 сарын 29 –нд БАС-ын ЭЗөвлөлөөр хэлэлцүүлсэн.



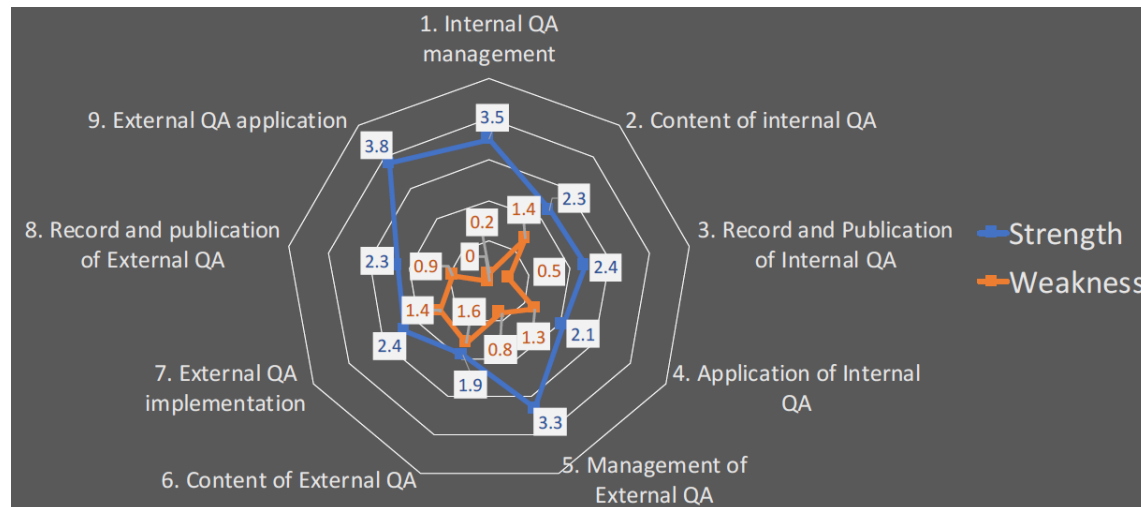
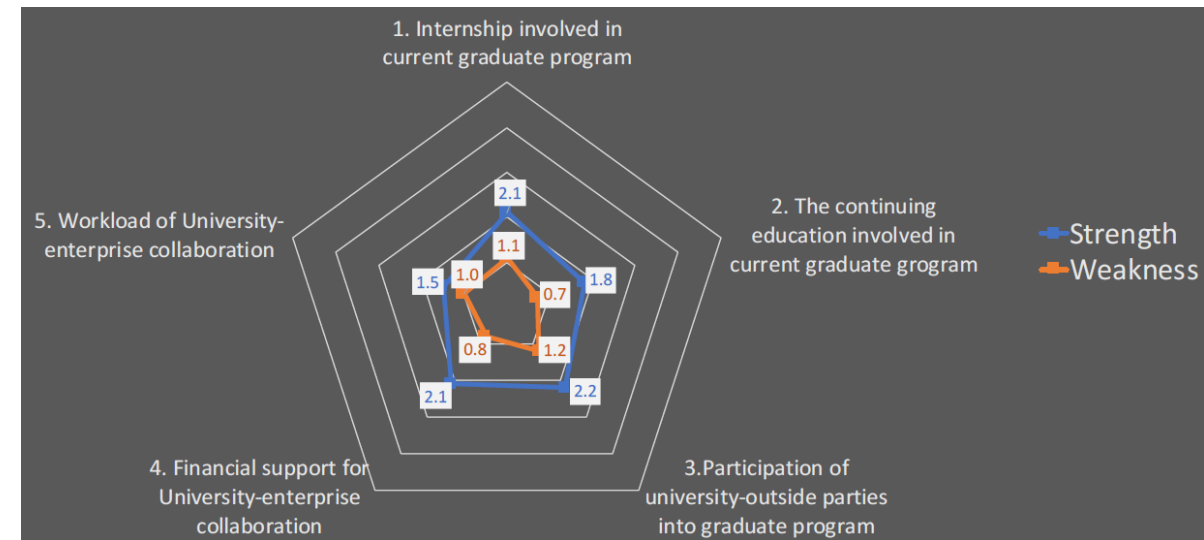
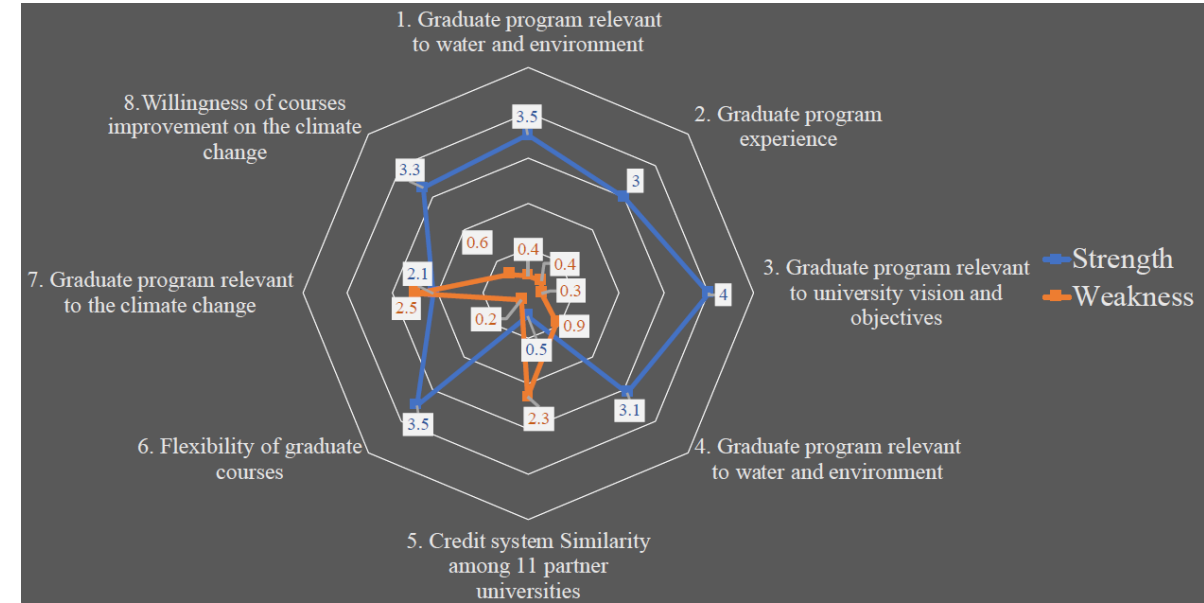
# Тулгарч буй бэрхшээл, шийдэл

- Багш нарын хэлний бэрхшээл – Сайжруулах боломжтой.
- Мэдээллийн дутмаг байдал – Хөтөлбөрийн түвшинд – Сайжирна.
- Лаб төхөөрөмж худалдаж авах – NMBU төлнө.
- Томилолт, сургалтууд биечлэн зохион байгуулах - КОВИД
- Ажлын хөлсний хуваарилалт – ШУТИС (8467.5 → 8453 EUR – 28'866'955 ₮)

Names	Role	Working time	Planned in the Project			Contribution in days						
			Cost allocated, EUR	Cost allocated in MNT	Tax reduced, MNT	WP1	WP2	WP3	WP4	WP5	WP6	WP7
Ayurzana Badarch	Manager	90	4,230.00	14,445,450.00	13,000,905.00	9	18	18	18	9	9	9
Nasanbayar Narantsogt	Resource person	147	4,851.00	16,566,165.00	14,909,548.50	16	45	29	15	14	13	15
Baasansuren Sandir	Resource person	145	4,785.00	16,340,775.00	14,706,697.50	15	45	29	15	14	13	14
Boldbaatar Nyamjav	Technical person	25	550.00	1,878,250.00	1,690,425.00		2.5	17.5			5	
Suuntsatsal Dovdon	Assistance	55	935.00	3,193,025.00	2,873,722.50	5.5	5.5	5.5	5.5	5.5	5.5	22
Ochirbat Baatar	Mentor	10	330.00	1,126,950.00	1,014,255.00		2		2	2	2	2
QA person	Quality and dissemination	10	330.00	1,126,950.00	1,014,255.00	1				4	4	1
Gantigmaa	External resource person	28	924.00	3,155,460.00	2,839,914.00	2	10	10	2		2	2
			16,935.00	57,833,025.00	52,049,722.50	48.5	128	109	57.5	48.5	53.5	65

# Хүлээгдэж буй үр дүн

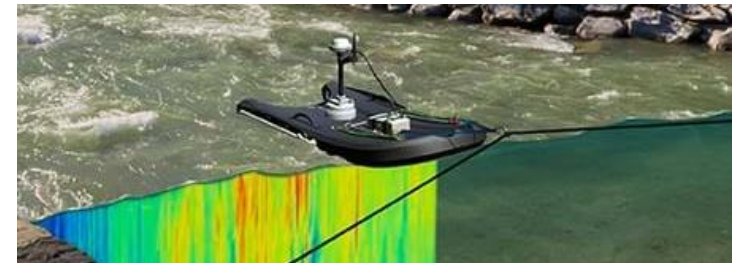
- Лабораторийн төхөөрөмжүүд худалдан авах
- Хичээлийн материал, ном бэлдэх, хэвлүүлэх
- Багш нараа чадавхжуулах
- Оюутнуудыг сургалтад хамруулах
- Хамтарсан судалгааг өргөжүүлэх



# Төслийн үйл явц (2021-2022)

2	DE - THOWL, Martin Oldenburg	T2.1.1 Staff training on curriculum development	THOWL: Oldenburg		4/30/2021	12/31/2021
		T2.1.2 Curriculum design workshop	NMBU: Ratnaweera	MUST: Ayurzana	4/30/2021	12/31/2021
		T2.1.3 Curriculum evaluation by stakeholders	SIAT		10/1/2021	7/31/2022
		T2.1.4 Design and planning of syllabi for 3 courses	UoP: Weerakoon		4/30/2021	12/31/2021
		T2.2.1 Development of lecture materials	UWM: Koronkiewicz		9/17/2021	6/30/2022
		T2.2.2 Development of textbook chapters	MUST: Ayurzana	MUST: Nasanbayar MUST: Ayurzana	9/17/2021	6/30/2022
		T2.2.3 Development of practical (laboratory) exercises	UWM: Koronkiewicz		9/17/2021	6/30/2022
		T2.2.4 Upgrade of laboratories	UWM: Koronkiewicz		3/18/2022	
		T2.2.5 Evaluation and harmonisation of content	UWM: Koronkiewicz		4/30/2022	9/30/2022
		T2.3.1 Training of trainers	QUT: Xiaodong NMBU: Zakhar	Mongolia: MUST: Nasanbayar	10/30/2021	6/30/2022
		T2.3.2 Trainings in Partner Countries	QUT: Xiaodong	Mongolia: MUST: Baasansuren MUST: Ayurzana	4/30/2022	9/30/2022
		T2.3.3 Cross-evaluation at open lectures	QUT: Xiaodong; NMBU: Ratnaweera		10/30/2023	
		T2.3.4 Testing by students	QUT: Xiaodong; NMBU: Andersen	Mongolia: MUST: Boldbaatar	4/30/2023	
		T2.3.5 Revision of content	QUT: Xiaodong; NMBU: Ratnaweera		4/3/2023	
		T2.3.6 Accreditation and formalisation	QUT: Xiaodong		10/30/2023	

- 2021 оны 11 сарын 30-нд ШУТИС-д лабораторийн төхөөрөмж авах санхүүжилтийг NMBU шилжүүлсэн. 26 485 EUR ~ 85.3 сая ₮. - ШУТИС-аас тендер зарлахж худалдан авалт хийж байна.

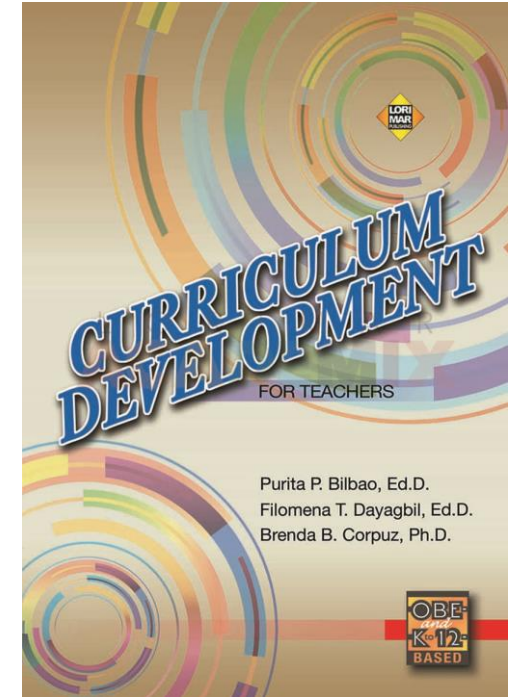


# Төслийн үйл явц (2021-2022)

- 2021 оны 12 сарын 02 –нд WP2 –ын T2.1.1 заасан хөтөлбөр боловсруулах ажилтнуудын сургалт болсон – Сургалтын үр дүнд шинжилгээ хийж T2.1.2 Curriculum development workshop –ийг төлөвлөсөн.

## Courses:

1. **Big Data for integrated Climate Change & Water management**
2. **Storm Water management with Low impact development and non-conventional water reuse**
3. **Integrated Water Resources Management under Climate Change**

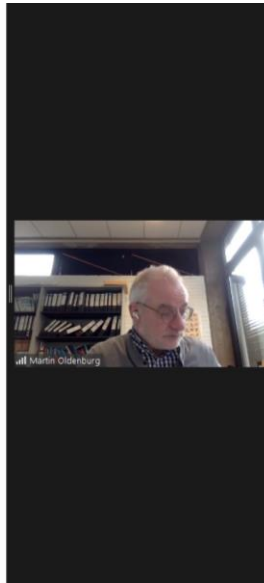


WP2: T2.1: Staff training on curriculum design

## Features of the curriculum

- Who teaches? – the teacher
- Who do the teachers teach? – The learners
- What do the teachers teach? – Knowledge, Skills, Values
- How do teachers teach? – strategies and methods
- How much of the teaching was learned? Performance
- With whom do we teach? – community partners

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



02.12.21 | Online

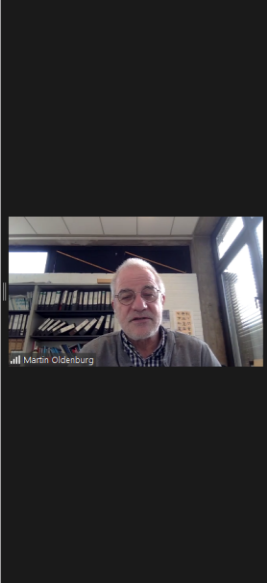
12

WP2: T2.1: Staff training on curriculum design

## Characteristics of a good curriculum

- Continuous development
- based on the needs of the students and other stakeholders (industry, etc.)
- developed on democratic rules
- results of a long term effort
- complex of details
- provision for the logical sequence of subject matter
- cooperation with other programs of the university
- educational quality
- flexibility towards changes in society like globalisation and digitization

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02.12.21 | Online

13

# Төслийн үйл явц (2021-2022)

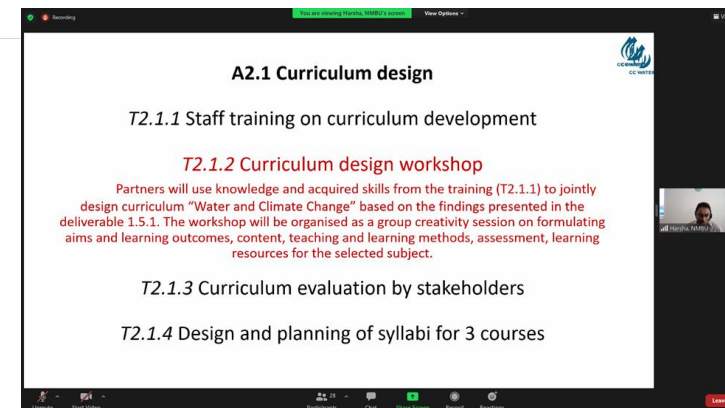
- 2022 оны 01 сарын 28 –нд WP5 –ын T5.1.1 Compendium of Quality Assurance policies and practices – д ШУТИС талаас хувь нэмэр оруулав. Оюутны элсэлт, Сургалтын үйл явц, Урамшуулал хяналт, Зэрэг олгох журмуудын дэлгэрэнгүй мэдээлэл багтсан. Тайлан 3.3-нд эцэслэгдсэн.
- 2022-02-16 CC Water WP5 T5.2.1 Quality assurance Committee meeting and Cross-project evaluation update уулзалтын төслийн менежерүүд, чанарын асуудал хариуцсан мэргэжилтнүүдтэй хийж гүйцэтгэв. 2022-02-10 –нд семинарын бэлтгэл ажлын уулзалтыг МУИС талтай хийв.
- 2022-02-23 WP2, T2.2.2 Development of textbook chapters – анхны саналыг илгээв.
- 2022-03-01 CCWater төслөөр 2 магистр оюутан 2022-06-10-2022-07-02 хүртэл Зуны сургалтад суралцах материалаа бүрдүүлж шалгаруулалтад тэнцэв.
- 2022-03-02 CCwater - T2.1.2 Curriculum development workshop болж өнгөрөв. Course 1: “Big Data for integrated Climate Change & Water management”, Course 2: “Storm Water management with Low impact development and non-conventional water reuse” Course 3: “Integrated Water Resources Management under Climate Change” хичээлүүдийн агуулгыг хэлэлцэж эцэслэв. 2022-03-18 хүртэл төлөвлөгөөнд санал нэмж оруулав.
- 2022-04-25 WP5, Quality Assurance – семинар Zoom –ээр болж өнгөрсөн. Уг семинараар Internal and External Quality assurance practices –ийг бүх сургуулиуд хоорондоо танилцуулж T5.1.1-д үндэслэн цаашдын арга хэмжээгээ төлөвлөв.



Role	Name	Contact info
WP-leader:	Sonamshing Nengul (WUM)	sonamshing@num.edu.mn
Task-leader:	Pilar von Pischau (TH OWL)	Katharina.pilar@th-owl.de



Role	Name	Contact info
WP-leader:	THOWL Oldenburg	Martin.Oldenburg@th-owl.de
Task-leader:	THOWL Oldenburg	Martin.Oldenburg@th-owl.de
Contributors:	IMUFE: Wei Liu THOWL: Pilar von Pischau	weiliu_2015@fz.com pilar.von.pischau@th-owl.de



**A2.1 Curriculum design**

T2.1.1 Staff training on curriculum development

**T2.1.2 Curriculum design workshop**

Partners will use knowledge and acquired skills from the training (T2.1.1) to jointly design curriculum “Water and Climate Change” based on the findings presented in the deliverable 1.5.1. The workshop will be organised as a group creativity session on formulating aims and learning outcomes, content, teaching and learning methods, assessment, learning resources for the selected subject.

T2.1.3 Curriculum evaluation by stakeholders

T2.1.4 Design and planning of syllabi for 3 courses

# Хүлээгдэж буй ажлууд

- WP1 –д хувь нэмэр оруулсан багш нарийн цагийн тооцоог хийж байна. ШУТИС, ЭШ газраас цалин олгоно.
- Лабораторийн төхөөрөмж худалдан авах тендерийн бэлтгэл ажил хийгдэж байна. 2022 оны эхээр худалдан авах ажиллагааг гүйцэтгэнэ.
- WP2 –д заасан ажлуудтай зэрэгцүүлэн Best practices of water resources allocation and water governance гэсэн хичээлийн хөтөлбөрийг боловсруулах төлөвлөгөө, агуулгыг дотоод багаараа гүйцэтгэнэ.

Анхаарал хандуулсанд баярлалаа.

2022 оны 6-р сарын 7-ны БАС –ийн Эрдмийн зөвлөлийн  
хуралд  
Танилцуулсан: Б.Аюурзана (PhD)