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Urban Resilience and Adaptation for India and Mongolia:
curricula, capacity, ICT and stakeholder collaboration to support green & blue infrastructure and nature-based solutions
619050-EPP-1-2020-1-DE-EPPKA2-CBHE-JP

Summary of the research agenda for Mongolia

Based on the discussions at URGENT Writeshop at the University of Pondicherry, May 3-16, 2022

Goal: The purpose of the writeshop was to elaborate on the general frame ensuring the consolidation of the URGENT research and research training action, and its sustainability after the end of the project lifetime. The following outputs are expected as a result of the writeshop (and the post-writeshop period)

The gaps in the expertise related to URGENT topics

- ~ Mongolia does not have an independent law on green space policy. The Law on Green space is necessary to regulate the relations related to the planning, maintenance, protection, rehabilitation and assessment of green space in urban areas. Therefore, it is necessary to learn from the experience of European partners on how to successfully implement the green space legislation.
- ~ Ulaanbaatar city faces high challenges because of growing urbanization and environmental degradation /air and soil pollution/. And there is a lack of understanding on using urban green spaces planning for urban resilience and livability. Therefore, research is needed to develop a multi-criteria-based classification system /systematization of urban green space/ of green space planning that meets the social and ecological needs of the city.
- ~ Urban Ecology: Landscape Architectural Planning Services: There are no studies that have identified the multifaceted impact of landscape architecture planning on urban ecology and the healthy and safe lives of its citizens. Therefore, MULS wants to launch a joint doctoral study aimed at proposing optimal landscape architectural planning to reduce the negative impact on the sustainable development of the city, positively influencing the decisions of policymakers, publicizing the research results, and promoting professional values.
- ~ At a time when Mongolia is launching the “Billion Trees” national campaign, the question is where and how to plant a billion trees in an ecologically and economically efficient way. Comprehensive landscape architecture planning is essential for the effective implementation of this national campaign. Therefore, we need good experience and advice on landscape architecture planning in foreign countries.
- ~ Heavy metals and pesticides are dangerous pollutants in the environment and serious problems to human health and agricultural production. In Mongolia, the issue of urban environmental pollution is of great concern, and research study (MSc and PhD thesis) to assess the accumulation of heavy metals and pesticide residues in urban agriculture soils and vegetable crops is very important. It would be very helpful to depth understanding of the bioaccumulation, mechanism of action, and transmission pathways of both toxicants, and their human health harms through transference in the food chain.
- ~ There is no integrated database of green-blue infrastructure in urban area, research materials are not widely available, no accurate statistical data exist, collaboration between same or similar organizations are weak.
- ~ Lack of human capacity who has modern understanding about urban sustainable development, 3D spatial green planning, nature-based solution, ecological technology, ecological service and disservice.
- ~ In small town case such as Khovd center, knowledge and experience of land managers, architectures, urban planners are outdated.



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- ~ University curriculums for land managers, urban planners, land cadastral are based on geographical science. They need to have spatial engineering knowledge.



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Knowledge gap:

Lack of knowledge and experience in adapting to urban climate change, planning and availability of green and blue facilities, location appropriateness, environmentally friendly solutions and spatial suitability analysis for green-blue infrastructure.

1. Guideline and legal environment: Classification and legal issues of urban green space planning;
2. Urban Ecology: Landscape Architectural Planning Services;
3. Landscape architecture: National Campaign to Plant One Billion Trees;
4. Urban-Agriculture: air/soil pollution and food quality and safety issues;
5. Terminology understanding: urban sustainable development, 3D spatial green planning, nature-based solution, ecological technology, ecological service and disservice

Doctoral and master's research topics:

1. Urban green space classification and systematization
2. Urban Ecology: Landscape Architectural Planning Services
3. Billion Tree National Campaign and effective landscape architecture planning
4. Heavy metals and pesticides toxicity in urban agricultural soil and plants
5. Ecosystem service and disservice in urban environment

Challenges / gaps / specific requests

This specific challenges and requests can be addressed by the following means:

- ~ direct requests to the experts from EU partners;
- ~ short visits by EU/IN students or staff to/from the EU with purposes of e.g. developing teaching and learning materials, thesis chapters and publications, relevant project proposals;
- ~ co-supervision of PhD and/or MSc students.

Topic	Challenges	Gaps	Requests	URGENT WP	Mongolian partners	European partners
Guideline and legal environment: Urban green space classification and systematization	In-depth research in this area has been done before, and experts lack knowledge and Weak management and policies on landscape architecture planning	There is no comprehensive database and weak coordination of professional organizations There is no integrated policy of landscape architecture planning based on an urban sustainable development program	Learn from international experience and methods, conduct joint research with experienced professors	To develop capacity for academic mobility	UPRI	
Urban Ecology: Landscape Architectural Planning Services	There is no professor who has supervised a doctoral student in landscape architecture	There is no unified urban green space planning	Co-supervision of a new doctoral thesis specifically addressing of this topic	Build capacity of teaching staff	NUM	
Billion Tree National Campaign and effective landscape architecture planning	Lack the experience to effectively implement the Billion trees national campaign	lack of experience and methodology for developing comprehensive landscape architecture planning.	Learn from international experience and methods, conduct joint research with experienced professors	Improving the knowledge and skills of teaching staff	NUM UPRI NGP	



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Heavy metals and pesticides toxicity in urban agricultural soil and plants	Lack of laboratory supply and capacity	Monitoring and assessment of pesticide usage in agriculture are poorly developed	Co-supervision of a new MSc and PhD thesis, Mutual visits and support to the fieldwork and laboratory analysis	To develop capacity for academic mobility	NUM	
Integrated open database of green-blue infrastructure	There is no integrated database of green-blue infrastructure in urban area, research materials are not widely available, no accurate statistical data exist, collaboration between same or similar organizations are weak.		To organize training how to use drone application to built database and mapping	To train specialist and show actual examples	UPRI NGP	
Modern understanding	Lack of human capacity who has modern understanding about urban sustainable development, 3D spatial green planning, nature-based solution, ecological technology, ecological service and disservice.		To organize training in Mongolian languages with examples	Build capacity of teaching staff and specialist	UPRI NGP	

Mongolian team has been organized virtual meeting about gaps in the expertise and knowledge on 16 May 2022. Before the meeting, we developed questionnaire on gaps in the expertise and knowledge, and collected answers were attached.