

A Review of Urban Green and Blue Infrastructure from the Perspective of Food -Energy-Water Nexus

Aamir Mehmood Shah ¹, Gengyuan Liu ^{1,2,*}, Fanxin Meng ¹, Qing Yang ³, Jingyan Xue ¹, Stefano Dumontet ⁴, Renato Passaro ⁵ and Marco Casazza ^{4,6}

¹ State Key Joint Laboratory of Environment Simulation and Pollution Control, School of Environment, Beijing Normal University, Beijing 100875, China; aamirmehmood55@hotmail.com (A.M.S.); fanxin.meng@bnu.edu.cn (F.M.).

² Beijing Engineering Research Center for Watershed Environmental Restoration & Integrated Ecological Regulation, Beijing 100875, China

³ Key Laboratory for City Cluster Environmental Safety and Green Development of the Ministry of Education, Institute of Environmental and Ecological Engineering, Guangdong University of Technology, Guangzhou 510006, China; yangqing14@mails.ucas.edu.cn

⁴ Centro Direzionale, Department of Sciences and Technologies, University of Napoli 'Parthenope', Isola C4, 80143 Napoli, Italy; stefano.dumontet@uniparthenope.it (S.D.); marco.casazza001@studenti.uniparthenope.it (M.C.)

⁵ Centro Direzionale, Department of Engineering, University of Napoli 'Parthenope', Isola C4, 80143 Napoli, Italy; renato.passaro@uniparthenope.it

⁶ Interdepartmental Research Centre on Urban and Event Studies (OMERO), University of Torino, Lungo Dora Siena 100 A, 10153 Torino, Italy

* Correspondence: author: liugengyuan@bnu.edu.cn

1. Literature search

Our data originates in a Science-Direct electronic database during the time period 2011 - 2020 (the final search was performed on Jan. 10, 2021). Science-Direct is a subscription-based scientific citation indexing service that provides a comprehensive citation search.

A few steps were taken to create a systematic literature search. (1) We to begin with recognized four predominant topics, specifically, urban, green-blue infrastructure, food, water, and energy, as extensively discussed in the scientific literature. (2) Our main goal of this review is about the effects of green-blue infrastructure (GBI) on food-energy-water (FEW) nexus in urban zones. When we seek for city FEW nexus terms, the results are limited (< 90), so that we decided to eliminate the term nexus (for while) and divide the search into different ways: such as (a) Urban+GBI+Food or Urban+GBI+food+water or Urban+GBI+food+water+energy; (b) Urban+GBI+Water; (c) Urban+GBI+Energy etc.. We aim to identify GBI-related studies and their impacts on one or more FEW nexus components. (3) We write the selected keywords on the Science-Direct, finding more relevant terms, and removing the terms that delivered unauthentic results. (4) We created basic criteria to rate records as either 'relevant' or 'not': "is this record important for an evaluation of urban GBI influencing any component of the FEW nexus in cities?" With the current search criteria, a total of 873 articles were retrieved.

During this process, we applied some limitations to the enquiry. Firstly, the study used the GBI and FEW nexus concepts. Secondly, the study carried out its nexus studies in either a specific city or urban cities within a country. Finally, the research examines and quantifies multiple environmental benefits and negative externalities of GBI that influence the nexus. Publications that did not meet the following criteria were excluded from this paper. Moreover, our outcomes are not completely comprehensive, since the further databases are available (for example, Scopus, Web of Science). Yet, our search outcomes in an impartially restrictive selection of articles, sufficient to deliver an overview of the main topics of city GBI and the FEW nexus. In the following table S1, each row shows a search enquiry written in the Science-Direct by using the "advanced search" function.

Table S1: Food, energy and water topics associated to urban GBI topics

AND...		
Topics	Urban context	Green-blue infrastructure
Food ("food" OR "agriculture" OR "foraging" OR "farming" OR "diet")	AND = ("urban*" OR "city" OR "cities" OR "municipal" OR "metropolitan")	AND = ("green infrastructure" OR "blue infrastructure" OR "green spaces" OR "green roof*" OR "rooftop garden" OR "green belt" OR "green walls" OR "greenbelts" OR "urban forest" OR "urban nature" OR "urban greening" OR "community garden*" OR "rain garden" OR "allotment garden" OR "nature-based solution*" OR urban tree* OR "urban street trees" OR "bioswale" OR "permeable pavements" OR "lawn" OR "vegetation" OR "forest" OR "constructed wetland*" OR "urban lakes*" OR "ponds" OR "urban stream" OR "river")
Water ("water conservation" OR "water runoff" OR "water" and "water use" OR "water quantity" OR "water quality" OR "water management" OR "water infiltration" OR "water supply" OR "water treatment" OR "water security and safety" OR "wastewater" OR "wastewater reuse" OR "water saving*" OR "water consumption" OR "water loss" OR "water purification" OR "water resource" OR "water footprint" OR "water sanitation" OR "peak flow" OR "retention capacity" OR "drainage" OR "flooding" OR "stormwater reuse" OR "integrated water resource management" OR "hydrology" OR "sponge city" OR "water temperature control" OR "erosion control" OR "groundwater recharge")		
Energy ("energy" OR "energy effects" OR "energy savings" OR "energy performance" OR "energy demand" OR "energy security" OR "urban heat island*" OR "heat load" OR "heat wave" OR "heat network" OR "air conditioning" OR "temperature control" OR "temperature decrease" OR "thermal effects" OR "cooling impact" OR electric* OR "solar" OR "photovoltaic solar radiation" OR "small wind turbines" OR "carbon dioxide" OR "greenhouse gases")		