



Managing urban biodiversity and green infrastructure to increase city resilience



URBANGAIA

António Ferreira & Paulo Pereira

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BiodivERsA COFUND Call (2015-2016)

« Understanding and managing biodiversity dynamics to improve ecosystem functioning and delivery of ecosystem services in a global change context: the cases of soils and sediments, and land- river and sea-scapes »



CONSORTIUM DESCRIPTION



URBANGAIA consortium:

Partner 1 (coordinator): António Ferreira , CERNAS/ESAC/IPC, Portugal, funded by Fundação para a Ciência e a Tecnologia

Partner 2: Jörg Priess, Helmholtz Centre for Environmental Research-UFZ, Germany, funded by Deutsches Zentrum für Luft- und Raumfahrt

Partner 3: Sander Jacobs, Institute of Nature and Forest Research, Belgium, funded by Belgian Federal Science Policy Office.

Partner 4: Paulo Pereira, Mykolas Romeris University, Lithuania, funded by Research Council of Lithuania.

Partner 5: Juan Martinez-Murillo, Malaga University, Spain, funded by Ministerio de Economia y Competitividad.

PROJECT DESCRIPTION



The URBANGAIA project aims at developing strategies based on the participatory involvement of all citizens that will be able to express their opinions using advanced IT and communication technology to inform their preferences on the planning and management of the green and blue infrastructure, aiming at more sustainable cities.

Work Package 1: Ecological analysis of case studies

Work Package 2: Governance analysis of the case studies

Work Package 3: Assessing urban U-GBIs' multiple values and ecosystem service demand

Work Package 4: Typology and scenarios of Nature Based Solutions

Work Package 5: Dissemination and outreach

SOCIETAL / POLICY OUTPUTS



- *An analysis of the current EU documentation on Urban Green/Blue Infrastructure and the related pertinent areas, that may influence U-GBI, based on 34 criteria, to assess consistency and pinpoint key issues to improve the next generation of legal documents.*
- *A comparative analysis of the regulations for the four case studies, at national, regional and local level (and their relation to the EU level).*
- *The use of cutting edge technology to encourage new forms of participation, in a citizen science context (e.g. using the MapNat app).*

SOCIETAL / POLICY OUTPUTS

Construction of a database to analyse the existing EU legislation documents against the following criteria:

Relations to other relevant EU policies and funding

Definition of GI
Reference to funding programs
Interaction with other policies CAP, Spatial planning, Forestry strategy
Multiple scale and integrated approach
Creation of sense of community

Relations to factors fostering impact

Non Government actors involvement
Conflict prevention
Construction of hegemonic visions
Induces cooperation
Enabling power networking
Enabling Negotiation
Business

Relations to other environment issues

Use as climate change and disaster risk management
Fostering natural capital
Cost effective green solutions (waste water)
Nature conservation
Integrating GI into key policy and funding programs
Contribution to circular economy and bio-economy
Public participation and citizen science

Relations to key EU legislation requirements

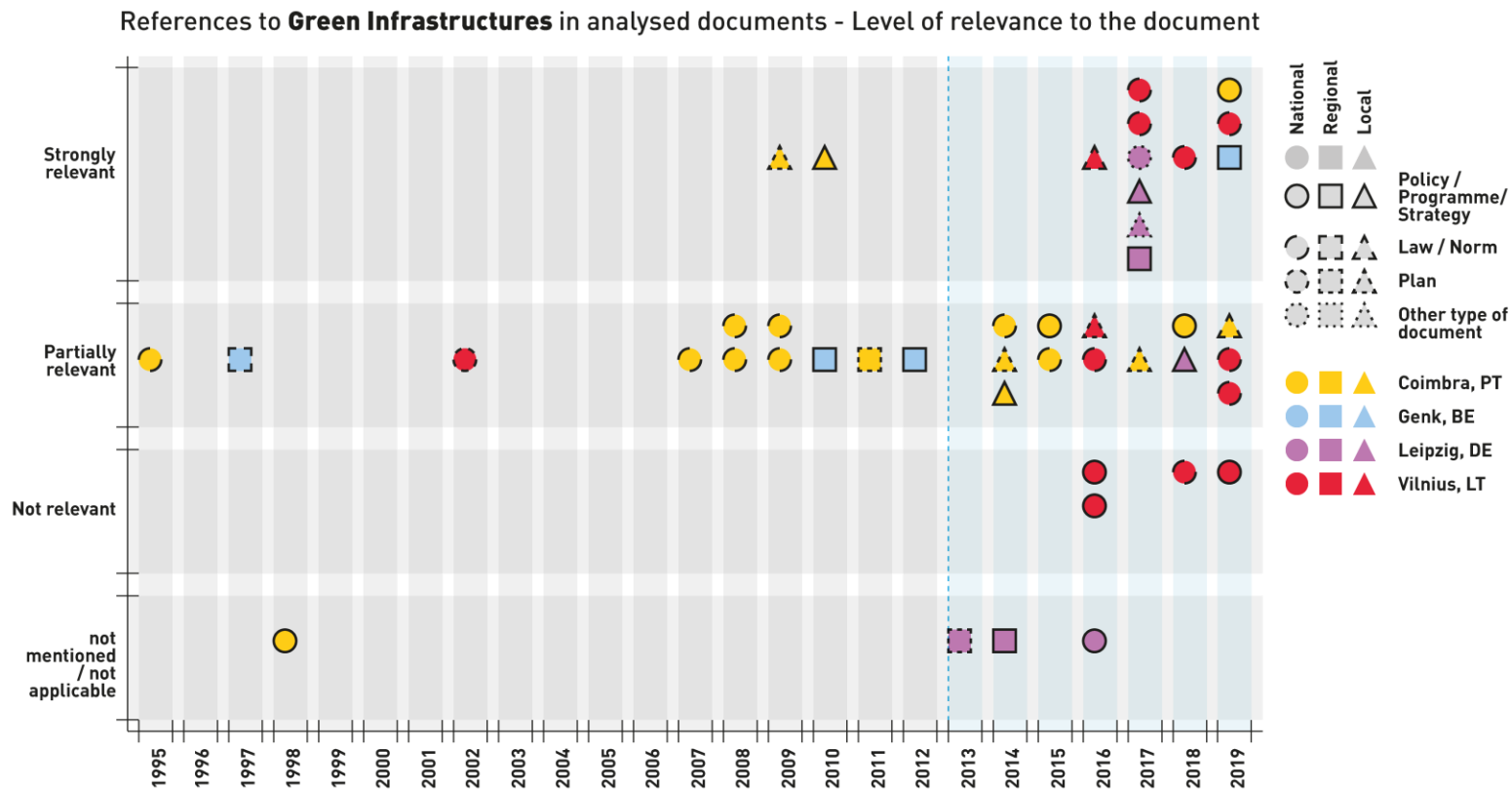
Transparency (openness)
Equity
Accountability
Knowledge sharing and learning
Conflict resolution
Resilience and innovation
Integrated landscape planning
Horizontal coordination across sectors and jurisdictions
Vertical coordination among levels
Connectivity to national and international developments
Coordination of customary and formal governance
Perceptions and knowledge of sustainability
The presence of enabling rules
Implementation and enforcement
Promotion of sustainable practices

SOCIETAL / POLICY OUTPUTS



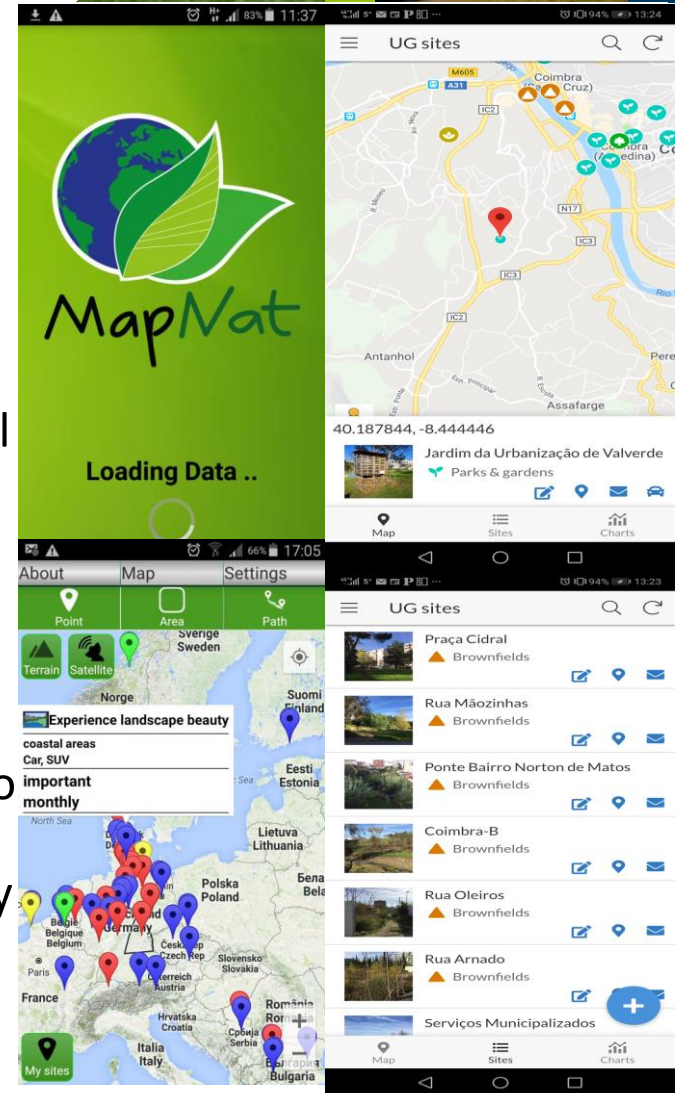
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Comparison of legal/mandatory documents at national, regional and local level.



SOCIETAL / POLICY OUTPUTS

- MapNat smartphone app (**m**apping **n**ature's services) is designed as a tool for citizens and / or scientific research to map nature's services, which the person mapping them is currently using or studying.
- MapNat provides information about the environmental services provided by the green infrastructure, both at city and rural/wild locations, that can be used by citizens to plan and develop their activities.
- The records are sent from the phone to a server, that collects and processes the records of all users.
- Opening the map view of MapNat, users are enabled to identify spots or regions providing nature's services they may be interested in, which have been mapped by other users.





SCIENTIFIC OUTPUTS

Püffel C., D. Haase, J.A. Priess 2018. *Mapping brownfields in Leipzig. Ecosystem Services* 30, 73-85. DOI: <https://doi.org/10.1016/j.ecoser.2018.01.011>

Pereira, P., Brevik, E., Trevisani, E. (2018) Editorial: Mapping the environment. *Science of the Total Environment*, 610-611, 17-23.

Leitão, I, Ferreira CSS, Ferreira AJD (2019) Assessing long-term changes in potential ecosystem services of a peri-urbanizing Mediterranean catchment. *Science of the Total Environment* 660, 993–1003. <https://doi.org/10.1016/j.scitotenv.2019.01.088>

In preparation:

Ferreira, A.J.D., Priess, J., Jacob, S., Pereira, P., Martinez-Murillo, J., Ferreira C.S.S. The evolution of EU Legislation relevant to improve the resilience and impact of biodiversity in urban areas.

Ferreira C.S.S., Pereira, P., Martinez-Murillo, J., Ferreira A.J.D. The role of U-GBIs' distribution in reducing extreme flood risk in urban areas.

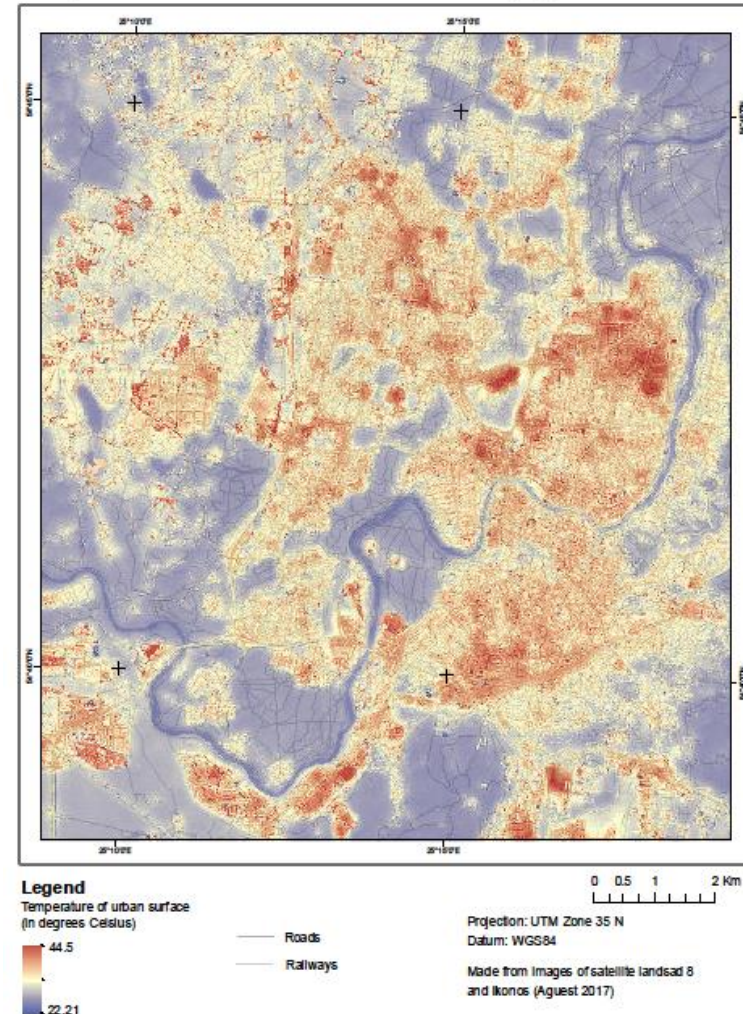
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SCIENTIFIC OUTPUTS

Heat island analysis: example from Vilnius

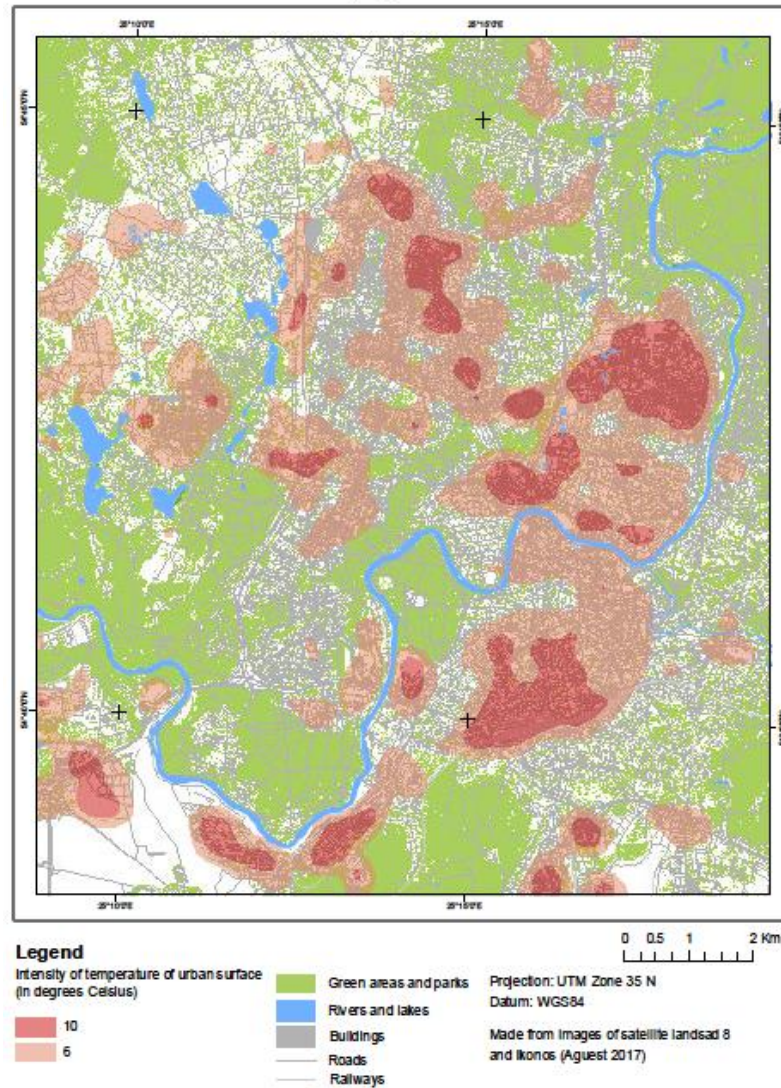
- Band 8 and 10 from Landsat 8 OLI.
- Warmest day in the summer.
- Temperature of ground surface.
- Kernel's model.
- Max and min temperature differences.
- Relation to existence and proximity to green areas.

Temperature of the urban surface in Vilnius, August 2017



SCIENTIFIC OUTPUTS

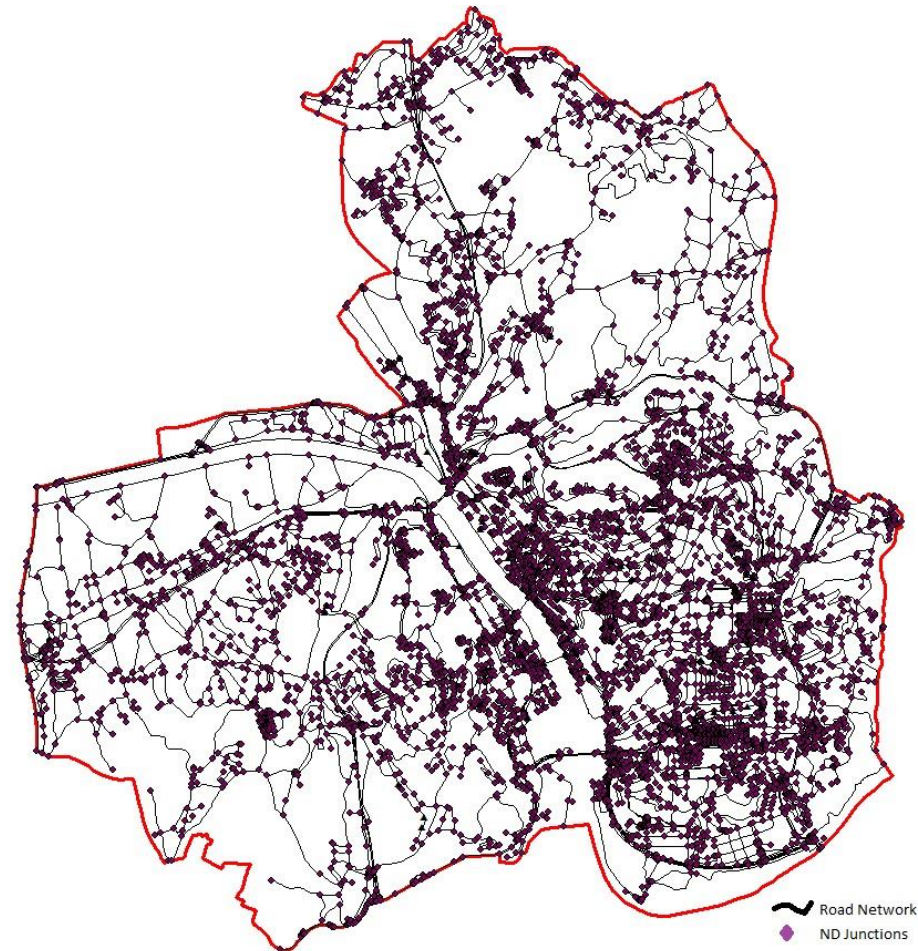
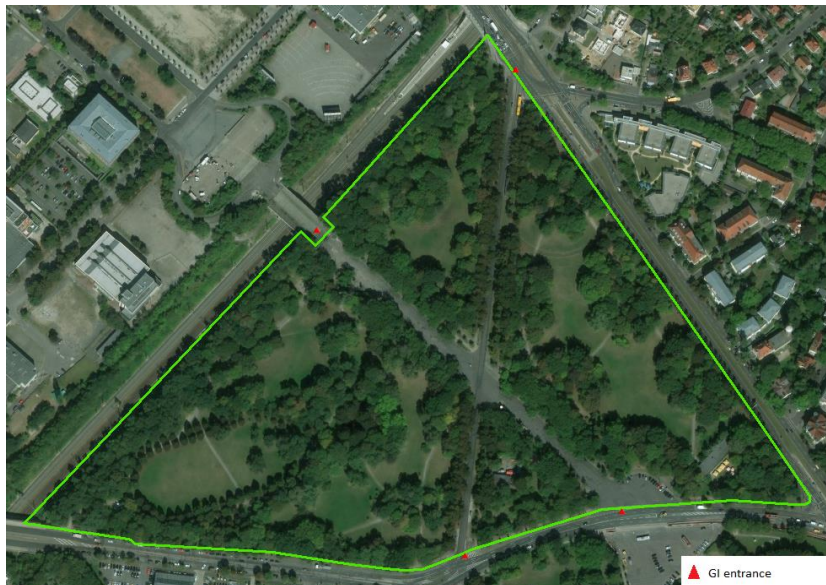
Urban Heat Island in Vilnius, August 2017



SCIENTIFIC OUTPUTS

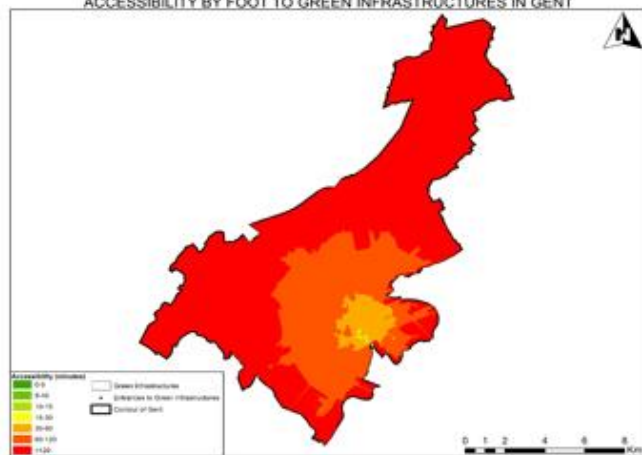
Criteria:

- Street maps and road network.
- Location of entrances to experimental sites
- Mean walking speed: 4 km/h (HWO).

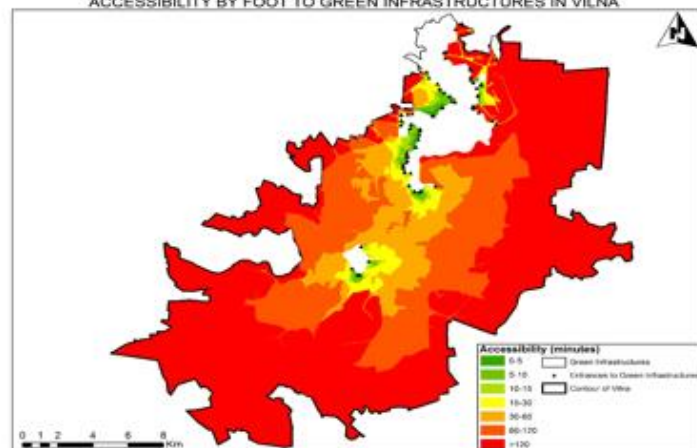


SCIENTIFIC OUTPUTS

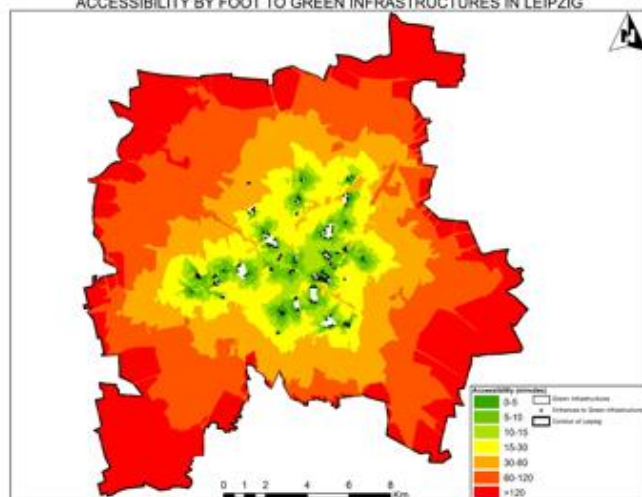
ACCESSIBILITY BY FOOT TO GREEN INFRASTRUCTURES IN GENT



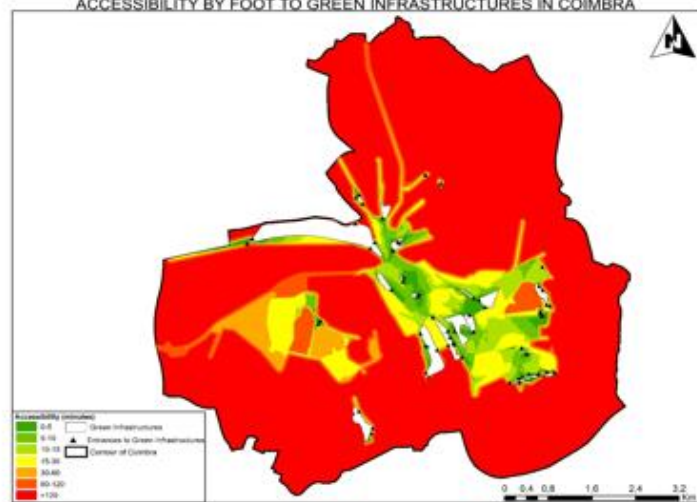
ACCESSIBILITY BY FOOT TO GREEN INFRASTRUCTURES IN VILNA



ACCESSIBILITY BY FOOT TO GREEN INFRASTRUCTURES IN LEIPZIG



ACCESSIBILITY BY FOOT TO GREEN INFRASTRUCTURES IN COIMBRA



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