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CALL FOR MASTER THESIS

Quantification and Analysis of Urban Design Effects on Mobility and Transport

Project framework:

This MSc thesis is offered within the GEMOTT (Grup d'Estudis en Mobilitat Transport i Territori) research group, within ICTA and the UAB's Geography Department.

Research Background:

Urban design plays a crucial role in shaping daily mobility patterns and determining how people move through their cities. This project seeks to explore how the morphological conditions of urban areas influence and define the transport choices of residents, potentially leading to more sustainable mobility models. With access to highly disaggregated urban data from multiple Spanish cities, including Madrid and Barcelona, the study will analyze the relationship between urban planning and mobility outcomes. The flexibility of the project allows students to focus on specific objectives related to urban design and mobility, while employing data analysis tools that are essential for understanding these dynamics.

Research question:

General:

- How does urban design influence mobility patterns and transport behavior in Spanish cities?

Specific:

- What are the key urban design features that promote or hinder sustainable mobility?
- How do different city layouts impact daily commuting behaviors?
- Can urban morphology be quantified to predict mobility outcomes?

Methods:

This project involves quantitative data analysis and GIS-based approaches to evaluate urban design and its impact on mobility. Students will work with detailed spatial data to assess the relationship between urban morphology and transportation patterns, utilizing methods suited to both GIS and statistical analysis.

Technical details:

The thesis will be directed by Dr. Oriol Marquet and the rest of the GEMOTT members. We expect that a revised version of the MSc Thesis will be submitted to a peer-reviewed journal for publication. This means that the final document will be an article of around 8.000 words (around 12-15 pages). The final document can be presented in Catalan, Spanish or English.

If you are interested on writing your MSc thesis on this topic, please contact oriol.marquet@uab.cat

CALL FOR MASTER THESIS

Analysis of Fare-Free Public Transport Policies

Project framework:

This MSc thesis is offered within the GEMOTT (Grup d'Estudis en Mobilitat Transport i Territori) research group, within ICTA and the UAB's Geography Department.

Research Background:

The concept of fare-free public transport has gained significant attention worldwide, with over 400 documented cases of implementation. These policies aim to reduce mobility barriers, promote sustainable urban travel, and increase social inclusion by making public transport accessible to all. However, the impacts and outcomes of these policies vary across contexts, raising important questions regarding their effectiveness. The project seeks to analyze the broad range of experiences, from case studies of cities that have implemented fare-free policies to the political discourse and media coverage surrounding the topic. It will also explore citizen support through surveys and analyze pre-existing data to understand the socioeconomic, environmental, and mobility impacts of such policies.

Research question:

General:

How do fare-free public transport policies impact urban mobility, social inclusion, and sustainability?

Specific:

- What are the key drivers of support and opposition to fare-free public transport policies?
- How do political narratives and media portray these policies?
- What are the measurable outcomes in terms of mobility patterns and public perception?

Methods:

The research will involve case study analysis, surveys to gauge public support, analysis of pre-existing data on fare-free policies, and qualitative methods such as discourse analysis of political and media narratives. Projects will combine both quantitative and qualitative approaches to provide a comprehensive understanding of fare-free public transport policies.

Technical details:

The thesis will be directed by Dr. Monika Maciejewska and the rest of the GEMOTT members. We expect that a revised version of the MSc Thesis will be submitted to a peer-reviewed journal for publication. This means that the final document will be an article of around 8.000 words (around 12-15 pages). The final document can be presented in Catalan, Spanish or English.

If you are interested on writing your MSc thesis on this topic, please contact monika.maciejewska@uab.cat

CALL FOR MASTER THESIS

Electoral analysis of support and opposition to transformative urban policies

Project framework:

This MSc thesis is offered within the GEMOTT (Grup d'Estudis en Mobilitat Transport i Territori) research group, within ICTA and the UAB's Geography Department.

Research Background:

Citizen support is a critical factor in the success of transformative urban policies and the promotion of sustainable mobility. Recent increases in political polarization and protests surrounding projects such as Superblocks (Superilles), Green Axes (Eixos Verds), pedestrianization, and the expansion of cycling networks highlight the need for new indicators to measure public support for these initiatives. This project aims to analyze electoral geography, using election results as indicators of public support or opposition to urban transformation policies. The analysis will provide insights into how political and spatial factors influence citizen responses to these projects. This call is framed within the ERC ATRAPA project and can take a single-city or multi-city approach

Research question:

General:

- How do spatial and electoral dynamics reflect public support or opposition to transformative urban policies?

Specific:

- What spatial patterns of support or opposition emerge from electoral results in areas affected by transformative urban policies?
- How do political and geographic factors influence the perception of urban transformation initiatives?
- Can electoral data be used as a reliable indicator of public acceptance or resistance to sustainable mobility projects?

Methods:

This project involves spatial analysis using GIS tools and statistical methods to analyze electoral data. The aim is to map and understand the geographical distribution of support or opposition to transformative urban policies, focusing on how these dynamics reflect public attitudes toward sustainable urban development

Technical details:

The thesis will be directed by Dr. Oriol Marquet and the rest of the GEMOTT members. We expect that a revised version of the MSc Thesis will be submitted to a peer-reviewed journal for publication. This means that the final document will be an article of around 8.000 words (around 12-15 pages). The final document can be presented in Catalan, Spanish or English.

If you are interested on writing your MSc thesis on this topic, please contact oriol.marquet@uab.cat

CALL FOR MASTER THESIS

Analysis of media coverage of public policies on sustainable mobility

Project framework:

This MSc thesis is offered within the GEMOTT (Grup d'Estudis en Mobilitat Transport i Territori) research group, within ICTA and the UAB's Geography Department.

Research Background:

Media coverage plays a crucial role in shaping public perception of sustainable mobility policies. This project aims to study how different media platforms (print, digital, and television) cover public policies related to sustainable mobility, focusing on a specific project. By analyzing the level of media attention and determining whether the coverage is positive or negative, the research will explore how media influence public opinion and policy development. Through a literature review and a well-developed methodology for analysis, this project will assess the role media plays in either supporting or hindering the implementation of sustainable mobility initiatives. This call is framed within the ERC ATRAPA project and can take a single-city or multi-city approach

Research question:

General:

- How do media platforms cover public policies on sustainable mobility, and what impact does this coverage have on the success or failure of these initiatives?

Specific:

- What are the characteristics of media coverage of sustainable mobility policies?
- How does media portrayal (positive or negative) affect public perception of these policies?
- To what extent does media influence the development and implementation of specific mobility projects?

Methods:

This project will involve a comprehensive review of media coverage, using both quantitative and qualitative approaches to analyze the discourse surrounding a chosen sustainable mobility project. The analysis will include bibliographic review, content analysis, and evaluation of the media's role in shaping public opinion and policy outcomes.

Technical details:

The thesis will be directed by Dr. Oriol Marquet and the rest of the GEMOTT members. We expect that a revised version of the MSc Thesis will be submitted to a peer-reviewed journal for publication. This means that the final document will be an article of around 8.000 words (around 12-15 pages). The final document can be presented in Catalan, Spanish or English.

If you are interested on writing your MSc thesis on this topic, please contact oriol.marquet@uab.cat

CALL FOR MASTER THESIS

Methodological Advances in Mapping Conditions for Active Mobility

Project framework:

This MSc thesis is offered within the GEMOTT (Grup d'Estudis en Mobilitat Transport i Territori) research group, within ICTA and the UAB's Geography Department.

Research Background:

Effective management of active mobility, such as walking and cycling, requires the development of territorial mapping indices to assess the potential of different areas to support this form of transportation. Creating indices for walkability, bikeability, or travel experience has become a priority for managing mobility in modern cities. This project aims to advance the methodological aspects of developing these indices, whether by creating new ones or reproducing validated indices in new geographic contexts. The project will explore key methodological challenges and innovations in the field, contributing to improved mobility planning.

Research question:

General:

- How can mapping indices be developed or adapted to better assess conditions for active mobility in different urban contexts?

Specific:

- What are the methodological challenges in developing indices for walkability and bikeability?
- How can existing indices be adapted to new geographic areas?
- What new indices could be developed to capture active travel experience more accurately?

Methods:

This project builds on the data and experience developed in the MOVACTES study and involves quantitative data analysis and GIS-based approaches to evaluate urban design and its impact on mobility. Students will work with detailed spatial data to assess the relationship between urban morphology and transportation patterns, utilizing methods suited to both GIS and statistical analysis.

Technical details:

The thesis will be directed by Dr. Oriol Marquet and the rest of the GEMOTT members. We expect that a revised version of the MSc Thesis will be submitted to a peer-reviewed journal for publication. This means that the final document will be an article of around 8.000 words (around 12-15 pages). The final document can be presented in Catalan, Spanish or English.

If you are interested on writing your MSc thesis on this topic, please contact oriol.marquet@uab.cat

CALL FOR MASTER THESIS

Analysis of Transport and Urban Transformation Plans through Discourse Analysis

Project framework:

This MSc thesis is offered within the GEMOTT (Grup d'Estudis en Mobilitat Transport i Territori) research group, within ICTA and the UAB's Geography Department.

Research Background:

Urban transformation plans, such as superblocks (superilles), low traffic neighborhoods, manzanas del cuidado, and woonerfs, are key strategies employed by cities globally to address climate change and promote sustainable mobility. However, a detailed examination of the language and discourse within these planning documents can reveal underlying priorities, values, and potential gaps. This project focuses on the discourse analysis of urban transformation plans to understand what social, environmental, and economic narratives shape these strategies and to critically evaluate the feasibility of their proposed goals. This call is framed within the ERC ATRAPA project and can take a single-city or multi-city approach

Research question:

General:

- How do urban transformation plans construct narratives around mobility, sustainability, and urban change?

Specific:

- What social, environmental, and economic priorities are emphasized or omitted in these plans?
- How do the discourses in planning documents align with or diverge from practical measures?
- What themes dominate the discussion of sustainability and mobility in urban transformation plans?

Methods:

This project will involve qualitative methodologies, with a strong emphasis on discourse analysis of urban transformation planning documents. Students will analyze the language, themes, and narratives within these documents to assess their underlying assumptions and realistic outcomes.

Technical details:

The thesis will be directed by Dr. Oriol Marquet and the rest of the GEMOTT members. We expect that a revised version of the MSc Thesis will be submitted to a peer-reviewed journal for publication. This means that the final document will be an article of around 8.000 words (around 12-15 pages). The final document can be presented in Catalan, Spanish or English.

If you are interested on writing your MSc thesis on this topic, please contact oriol.marquet@uab.cat

CALL FOR MASTER THESIS

Psychometric development of a questionnaire on emotional responses to urban transformations

Project framework:

This MSc thesis is offered within the GEMOTT (Grup d'Estudis en Mobilitat Transport i Territori) research group, within ICTA and the UAB's Geography Department.

Research Background:

Urban transformations, such as gentrification and changes in mobility, often evoke strong emotional responses from residents. This project aims to develop a psychometric questionnaire to measure these emotional reactions, such as anxiety, triggered by urban transformations. Grounded in environmental psychology, the study will involve the conceptual development of key emotional factors and the psychometric validation of the questionnaire, ensuring its reliability and accuracy. The project will contribute to a deeper understanding of how urban changes affect emotional well-being and provide a valuable tool for evaluating emotional responses to these transformations. This call is framed within the ERC ATRAPA project.

Research question:

General:

- How can emotional responses to urban transformations be measured and validated using a psychometric questionnaire?

Specific:

- What are the key emotional factors triggered by urban transformations such as gentrification or mobility changes?
- How can a psychometric questionnaire be designed to reliably measure these emotional responses?
- What validation methods are required to ensure the questionnaire's reliability and accuracy?

Methods:

The project involves quantitative analysis and the application of psychometric methodologies to develop and validate a questionnaire that measures emotional responses to urban transformations. The process will include both the conceptual development of emotional factors and the statistical validation of the questionnaire's reliability and accuracy.

Technical details:

The thesis will be directed by Dr. Oriol Marquet and the rest of the GEMOTT members. We expect that a revised version of the MSc Thesis will be submitted to a peer-reviewed journal for publication. This means that the final document will be an article of around 8.000 words (around 12-15 pages). The final document can be presented in Catalan, Spanish or English.

If you are interested on writing your MSc thesis on this topic, please contact oriol.marquet@uab.cat

CALL FOR MASTER THESIS

Queering active mobilities: intersectional experiences of queer women when biking

Project framework:

This MSc thesis is offered within the GEMOTT (Grup d'Estudis en Mobilitat Transport i Territori) research group, within ICTA and the UAB's Geography Department.

Research Background:

In recent years, feminist and black geographies have illuminated how intersecting identities, like gender, race, or class, are embodied and performed when cycling. The unique combination of axes of oppression has been found to constraint mobility choices but also to be a potential site for politicization that challenges normative discourses. However, we are yet to gain understanding of how sexuality (intertwined with gender, race, age…) shapes travel choices and, consequently, access to opportunities, satisfaction, and well-being. Barcelona, renowned as a place of comfort for the LGBTQ+ community, offers an ideal setting for delving deeper into comprehending how queer identities are negotiated, embodied and performed during everyday cycling trips.

Objectives:

a) ***To understand the experiences of queer women when biking in Barcelona from an intersectional perspective***

Methods:

To do so, students will use a mixed-methods approach that combines qualitative interviews with Relief Maps. This method analyses power structures in relation to experience and place and will allow the student to explore how the intersection of gender and sexuality influences active travel behaviour, considering other intertwined axes such as race, class, motherhood, and age.

Technical details:

The thesis will be directed by Dr. Oriol Marquet (ICTA-UAB) and Jerònia Cubells (UAB) with the collaboration of the rest of the GEMOTT members. We expect that a revised version of the MSc Thesis will be submitted to a peer-reviewed journal for publication. The final document can be presented in Catalan, Spanish or English.

If you are interested on writing your MSc thesis on this topic, please contact oriol.marquet@uab.cat

CALL FOR MASTER THESIS

Rethinking the 15-minute city concept: Temporal and distance nuances in urban proximity

Project framework:

This MSc thesis is offered within the GEMOTT (Grup d'Estudis en Mobilitat Transport i Territori) research group, within ICTA and the UAB's Geography Department.

Research Background:

The 15-minute city concept, which seeks to bring daily destinations closer to residents, has gained prominence in urban planning. However, the assumption that 15 minutes is the optimal threshold for all destinations and individuals may be overly simplistic. This project explores temporal and spatial variations in proximity, examining how optimal time thresholds for different destinations vary depending on personal characteristics (age, gender, income) and relational factors (household composition, care responsibilities). By using a pioneering survey conducted across several Spanish cities, the project aims to challenge the universality of the 15-minute threshold and identify new proximity benchmarks better suited to diverse population needs.

Research question:

General:

- How do temporal and spatial thresholds for proximity vary based on individual characteristics and daily needs in different urban contexts?

Specific:

- How do personal and relational factors influence the optimal time threshold for accessing daily destinations?
- What is the role of gender and the transportation gender gap in shaping travel behavior?
- What variations exist in the perception of proximity across different cities?

Methods:

This project involves the analysis of survey data from multiple Spanish cities to identify new proximity thresholds. Using both quantitative and qualitative approaches, the student will explore how demographic factors influence travel behavior and proximity perceptions, challenging the standard 15-minute concept.

Technical details:

The thesis will be directed by Dr. Oriol Marquet and the rest of the GEMOTT members. We expect that a revised version of the MSc Thesis will be submitted to a peer-reviewed journal for publication. This means that the final document will be an article of around 8.000 words (around 12-15 pages). The final document can be presented in Catalan, Spanish or English.

If you are interested on writing your MSc thesis on this topic, please contact oriol.marquet@uab.cat

CALL FOR MASTER THESIS

Temporal and distance Nuances in Urban Proximity: Rethinking the 15-Minute City Concept

Project framework:

This MSc thesis is offered within the GEMOTT (Grup d'Estudis en Mobilitat Transport i Territori) research group, within ICTA and the UAB's Geography Department.

Research Background:

Very recently, the framework of chronourbanism, and more specifically, the 15-minute city as an urban policy promoting proximity environments by placing daily destinations within a short distance from home, has been gaining momentum. From academia, we have observed a growing number of papers aiming to investigate the 15-minute city from an applied perspective. However, this conception assumes that 15 minutes is an optimal threshold for daily activities, which is debatable and problematic. It is assumed that all services are needed in the same way, potentially overlooking differences in the type of destination (e.g., hypothesis: a bakery is more necessary to have closer than a hospital) and the people who use them (e.g., hypothesis: older individuals value having healthcare closer than cultural facilities). Studying these threshold variations is particularly relevant in a city like Barcelona, where the 15-minute city may be a somewhat unambitious idea. Some recent studies suggest that in certain parts of the city, it is actually more of a 10-minute or 5-minute city. Therefore, this study aims to add nuance to the idea of the 15-minute city by trying to identify new temporal thresholds that better align with population needs.

Research question:

General:

Understand the optimal time thresholds for diverse daily destinations.

Specific:

Are there differences in the establishment of these thresholds concerning individual characteristics (age, gender, income) and relational factors (household composition, care responsibilities) of individuals?

Methods:

To do so, the student will use a pioneering survey made under the ECOMOV & STEPP projects, both aiming to understand travel and social attitudes of residents living in areas with different levels of proximity in the Spanish cities of Barcelona, Palma de Mallorca, Granada and València.

Because of the technical aspects of the proposal, preference will be given to students with experience working with statistics softwares such as SPSS/ R studio. Skills on GIS are also appreciated.

Technical details:

The thesis will be directed Dr. Oriol Marquet and the rest of the GEMOTT members. We expect that a revised version of the MSc Thesis will be submitted to a peer-reviewed journal for publication. This means that the final document will be an article of around 8.000 words (around 12-15 pages). The final document can be presented in Catalan, Spanish or English.

If you are interested on writing your MSc thesis on this topic, please contact oriol.marquet@uab.cat

Title: *Changing Environmental & Energy Policies in Spain and their Implications for Housing Inequalities in Catalonia*
Supervisors: Brian Rosa and Austin Matheney, , BCNUEJ-ICTA
Specialization: Ecological Economics or Urban and Industrial Ecology
Contact: brian.rosa@uab.cat

The primary objective of this thesis is to analyze the national regulatory system of environmental and energy policies (EEPs) in Spain and assess their impact on housing inequalities, with a focus on implications for Catalonia. This study will focus on understanding the strengths, weaknesses, and emergent challenges within Spain's policy framework, particularly in light of the EU Green Deal and ongoing green transition initiatives (predominantly nature based solutions, residential retrofitting for improved energy efficiency, and densification through sustainable land use) implemented by the Generalitat, regional, and local policies. It aims to identify how environmental policies interact with housing markets, examining the economic, social, and institutional factors that shape policy outcomes related to energy efficiency, sustainable land use, and affordable housing.
Key research questions include:

1. How do EU and Spanish environmental and energy policies address housing inequalities, especially in relation to green transition goals, in Catalonia?
2. What economic mechanisms and institutional factors affect the implementation and outcomes of these policies?
3. How have specific EEP policies nfluenced housing inequality in urban and rural areas of Catalonia?

Methodology
This research will employ a mixed-methods policy analysis approach, integrating both qualitative and quantitative data. The methodology will include:

- **Data Collection**:
    - **Interviews**: Semi-structured interviews ((with a supervisor) with key policy actors, including policymakers, public agency representatives, and NGOs involved in environmental governance.
    - **Case Study Analysis**: Examination of case studies in Barcelona, Tarragona, and Olot, focusing on nature-based solutions, energy retrofitting, and land use policies.
- **Analysis**:
    - Thematic analysis will be conducted on the interview data, and case studies will be analyzed to explore the policy goals, instruments, and strategies implemented at the national and regional levels.

Expected Results
Key anticipated findings include:
:

1. **Regulatory Strengths and Weaknesses**: Identification of the economic mechanisms, institutional arrangements, and regulatory frameworks that promote or hinder equitable housing in the context of green transition policies.
2. **Impact on Housing Inequality**: Insights into the relationship between green transition policies, such as energy retrofitting and densification, and housing inequality, with a particular focus on vulnerable populations.
3. **Policy Recommendations**: Based on the findings, the study will propose policy recommendations to improve housing equality within green transition initiatives.

For this project, proficiency in Catalan and Spanish languages would be especially useful.

Societal metabolism of Costa Rica

Proposal for master thesis for the Master in Interdisciplinary Studies in Environmental, Social and Economic Sustainability – ICTA-UAB

Ecological economics – Industrial ecology

Costa Rica is considered one of the countries closer to social and environmental sustainability (Hickel, 2020). This project aims to provide a multidimensional quantitative assessment of the metabolism of this country, accounting for working hours, salaries, and GHG emissions. This will be done with production and consumption-based accounting perspectives through the use of environmentally extended input-output tables. This way, the student will explore the national economy, and the international dependencies generated in a globalization context.

The final aim is to publish a paper in a high-impact journal.

Requirements:

- Quantitative analysis (python)
- Use of environmentally extended input-output tables (desirable)

Please contact Dr. Laura Pérez Sánchez
(laura.perez.sanchez[at]uab.cat)

References:

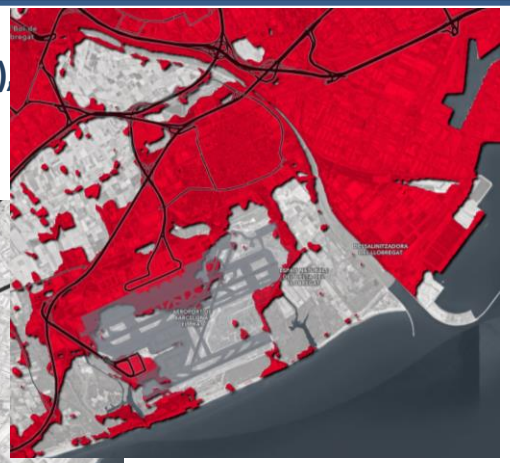
Hickel, J. (2020). The sustainable development index: Measuring the ecological efficiency of human development in the anthropocene. *Ecological Economics*, *167*(March 2019), 106331. https://doi.org/10.1016/j.ecolecon.2019.05.011

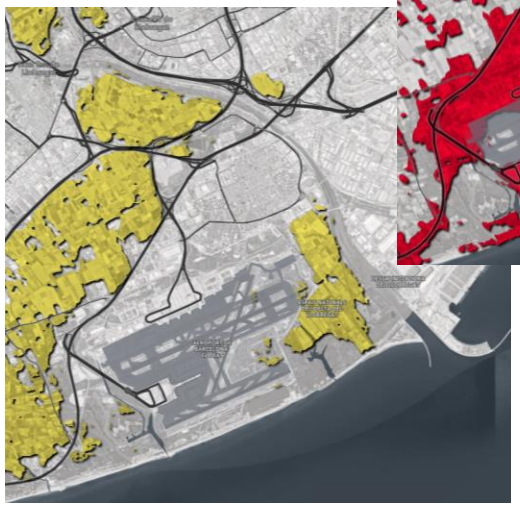
Research topic: Urban Metabolism of El Prat de Llobregat

- Research line: Urban Agriculture
- Research group: Sostenipra

CONTACT: veronica.arcas@uab.cat

Supervisor:
Xavier Gabarrell, PhD (ICTA)
Verónica Arcas, PhD (ICTA)





Waste production and management
Food production and food systems
Collaboration with municipality (Data/ Food strategy)

Urban farming systems have emerged to enable more resilient food provisioning systems, offering promising solutions to secure food supplies, produce more sustainable food, and reduce pressure on dwindling agricultural land by shifting food production to urban environments. Nonetheless, many current and prospective urban farming systems rely heavily upon external material and energy inputs, with little integration into their surrounding urban infrastructure, material, and energy flows. Thus, there is potential for further integration to promote more circular-based approaches through industrial and urban symbiosis for food production in cities.

The overall aim of the FOCUSE project is to explore, envision, develop, and analyze approaches to promote more circular-based food production in cities to enable sustainable and resource-efficient food provisioning.

The proposed work consists of the search and determination of existing waste flows and their link to urban agriculture in a specific case study located in the municipality of El Prat del Llobregat. This information will serve for a compilation of a material flow analysis of the case study and the determination of a circularity and production potential.

Main goal: To perform a material flow analysis to determine circularity potential through UA

MAIN TASKS:

1) To perform a literature review on existing urban material flows linked to urban and peri urban agriculture at city level.
2) Understand main waste flows from the municipality of El Prat del Llobregat
3) Define potential circularities for the construction, operation and fertilization of agricultural systems (or novel food products) through defined waste flows.
4) Discover application potential and scalability through material flow analysis
5) To write a peer-review paper for submission in a peer-review journal.

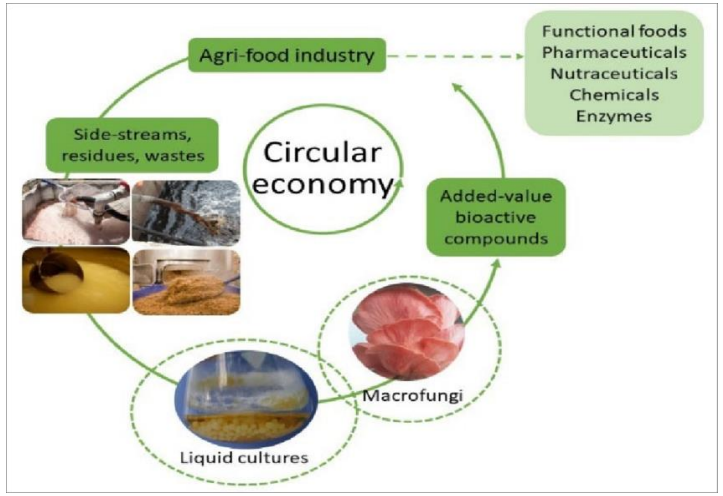
MINISTERIO DE CIENCIA E INNOVACIÓN
Financiado por la Unión Europea NextGenerationEU
Plan de Recuperación, Transformación y Resiliencia
AGENCIA ESTATAL DE INVESTIGACIÓN
ivl Swedish Environmental Research Institute
Fertilecity
sostenipra
UAB Universitat Autònoma de Barcelona
ICTA-UAB

Research topic: From waste to food: possibilities of mushroom production with circular solutions

- Research line: Mushroom growth
- Research group: Sostenipra

CONTACT: veronica.arcas@uab.cat

Supervisor:
Xavier Gabarrell, PhD (ICTA),
Verónica Arcas, PhD (ICTA), Guido Evangelista, MSc (ICTA)



Mushroom production from crop biomass:

In the UAB campus and at ICTA research building, various waste streams are generated, including biomass from pruning, food scraps, perlite and coffee grounds. One of the solution to take advantage of these flows could be to use these outputs to grow **edible mushrooms**. In addition, after the harvest of the mushroom, the spent mushroom substrate (SMS) could be used as fertilizer for future crop's cultivation.

The aim of this research is to investigate and analyse the possibility of **indoor mushroom cultivation in the ICTA building** by producing oyster mushroom (Pleurotus ostreatus) using residue biomass as substrate such as plant waste from tomato and corn crops with the addition of spent coffee grounds.

Main goal: To perform an analysis on the feasibility of mushroom cultivation with waste from the UAB campus.

MAIN TASKS:

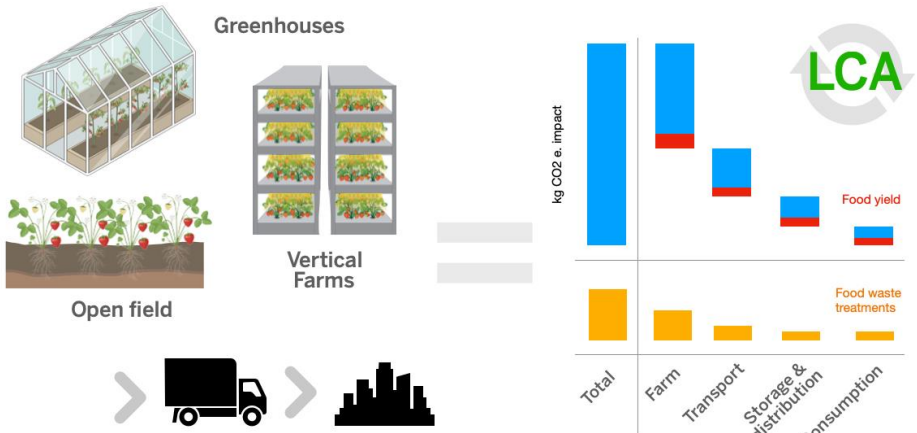
1) Understand main waste flows on a smaller scale (ICTA or UAB or from previous studies done)
2) Mushroom Pleurotus production inside a chamber that has dimensions of 69 width x 49 depth x 160 cm height, located the level -2 of the ICTA building
3) Environmental conditions control and report
4) Harvest process
5) To write a peer-review paper for submission in a peer-review journal.

sostenipra Fertilecity UAB Universitat Autònoma de Barcelona ICTA-UAB

- Research topic: Integrating urban agriculture into cities: a focus on food losses & LCA impacts
- Research line: Resource management for a circular economy, Urban Agriculture
- Research group: Sostenipra (ICTA), Dep. of Sustainable Development, Environmental Science & Eng. (KTH)

CONTACT: joan.munoz@uab.cat

Supervisor:
Joan Muñoz Liesa, PhD (KTH-ICTA), Pietro Tonini, PhD (ICTA)
Xavier Gabarrell, PhD (ICTA)



ECOFARM-CITY: Circular vertical farms to reduce environmental impacts in cities

Urban agriculture (UA) systems are gaining prominence as sustainable solutions within cities. However, environmental concerns are raised by the food losses that occur throughout various stages of the supply chain, from production to the supermarket or end-user. Additionally, composting processes linked to these losses pose challenges, as a portion of the compost in urban areas does not undergo municipal treatment but instead ends up in landfills due to capacity limitations of the AMB.

This work aims to broaden the current product-oriented focus of urban agriculture by including the environmental impacts of food losses in different UA systems, such as greenhouses, the RTG system at ICTA-UAB, a vertical farm in Barcelona, and open-field systems. The aim is to include the environmental impact of food losses produced at different stages of the supply chain for each system together with the impacts occurring at the production stage of these agricultural facilities.
The thesis will apply environmental impact assessments to a case study of the Barcelona region using existing inventories. We expect to examine the role of UA systems in the circularity of urban resource flows while offering guidance on how to optimize UA systems' integration into urban planning.

To quantify the environmental performance (LCA) of different agriculture systems, focusing on food losses throughout the supply chain

MAIN TASKS:

1) Identify common literature on existing urban agriculture impacts and composting strategies within cities.
2) Quantify main environmental impacts of a vertical farm vs other UA systems (some inventory case studies will be given).
3) Quantify food losses and the derived environmental impacts. Define improvements and guidance for future implementation of UA systems
4) Write a peer-review paper for submission in a peer-review journal.

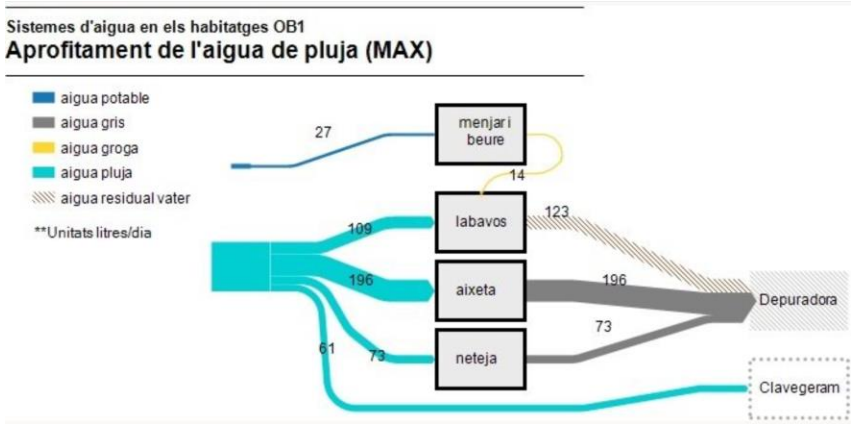
KTH VETENSKAP OCH KONST
ECOFARM-CITY vertical farms for circular cities
A research project funded by: FORMAS A SWEDISH RESEARCH COUNCIL FOR SUSTAINABLE DEVELOPMENT
ivl Swedish Environmental Research Institute
Fertilecity
UAB Universitat Autònoma de Barcelona
ICTA-UAB

Research topic: Water resilience in Catalan buildings to adapt to climate change

- Research line: Resource management for a circular economy, urban agriculture
- Research group: Sostenipra

CONTACT: anna.petit@uab.cat

Supervisor:
Anna Petit, PhD (ICTA), Verónica Arcas, PhD (ICTA), Xavier Gabarrell, PhD (ICTA)



The WEF4Build project aims to identify building solutions that can help us adapt to climate change in Catalonia while providing water, energy and food to urban populations.

This Master's thesis aims to **identify and quantify the water flows of a set of buildings located in different climatic regions in Catalonia**. Through scenario modelling and LCA, the student will evaluate the environmental impacts and benefits of implementing solutions that take stock of building water flows to provide food and water to urban areas. Examples include rainwater harvesting and yellow water recovery for urban farms.

Main goal: To quantify the water metabolism of buildings and their environmental impacts by considering climate change scenarios.

MAIN TASKS:

1) To review the literature on building water flows and water-related strategies
2) To quantify the water flows in reference buildings
3) To conduct an LCA of the implementation of new solutions for water recovery
4) To propose recommendations for buildings according to climate change scenarios

IMPORTANT:
Prospective students MUST have taken the Industrial Ecology course

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UPC Universitat Politècnica de Catalunya BarcelonaTech

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UAB Universitat Autònoma de Barcelona

ICTA-UAB

Research topic: Social perception of producing food with recovered urine

- Research line: Resource management for a circular economy, urban agriculture
- Research group: Sostenipra

CONTACT: anna.petit@uab.cat

Supervisor:
Anna Petit, PhD (ICTA), Verónica Arcas, PhD (ICTA), Xavier Gabarrell, PhD (ICTA)

The WEF4Build project aims to identify building solutions that can help us adapt to climate change in Catalonia while providing water, energy and food to urban populations.

This Master's thesis focuses on the recovery of yellow water (urine) from buildings to produce viable fertilizers for urban agriculture. The study has a strong social science component. Considering that urine is a very sensitive topic, the student will evaluate whether Catalan citizens accept the use of urine as an alternative fertilizer. In this thesis, the student will analyse the results of a survey and draw conclusions and recommendations from an environmental, social, economic and political perspective.

Main goal: To assess the social acceptance of recovering urine to produce food in cities

MAIN TASKS:

1) To review the literature on urine recovery and social perception studies
2) To develop a conceptual framework to analyse survey results
3) To frame and provide recommendations from an environmental, social, economic and political perspective

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Fertilecity
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UAB Universitat Autònoma de Barcelona
ICTA-UAB

Research topic: Environmental assessment of circular resource management in a primary school

- Research line: Resource management for a circular economy, urban agriculture
- Research group: Sostenipra

CONTACT: anna.petit@uab.cat

Supervisor:
Anna Petit, PhD (ICTA)
Xavier Gabarrell, PhD (ICTA)

Metabolism of a rural primary school

Educational services play a pivotal role in sustainability transitions, as they can provide future generations with knowledge about sustainability practices. Escola Les Vinyes is a rural school in the Penedès area that has already implemented several circular strategies both in its facilities and in the school curriculum. Rainwater harvesting, urban gardening and PV panels are just some of the strategies already in place.

The proposed Master's thesis aims to assess to what extent the efforts made so far are helping the school reduce its environmental footprint. The thesis will study the food, energy and water metabolism of the school and provide recommendations for future actions.

REQUIREMENT: Fluent Catalan or Spanish is a must

Main goal: To estimate the environmental footprint of Escola Les Vinyes and to provide recommendations for future actions

MAIN TASKS:

1) To characterize the food, energy and water flows of the school
2) To characterize the current strategies implemented by the school
3) To quantify the metabolism of the school
4) To quantify the environmental footprint of the school
5) To provide recommendations

Agència de Gestió d'Ajuts Universitaris i de Recerca AGAUR
Escola Les Vinyes
sostenipra
UAB Universitat Autònoma de Barcelona
ICTA-UAB

Research topic: Life cycle assessment of a biobattery for bioelectricity generation

- Research line: Resource management for a circular economy
- Research group: Sostenipra

CONTACT: anna.petit@uab.cat

Supervisor:
Anna Petit, PhD (ICTA)
Laura Talens, PhD (ICTA)

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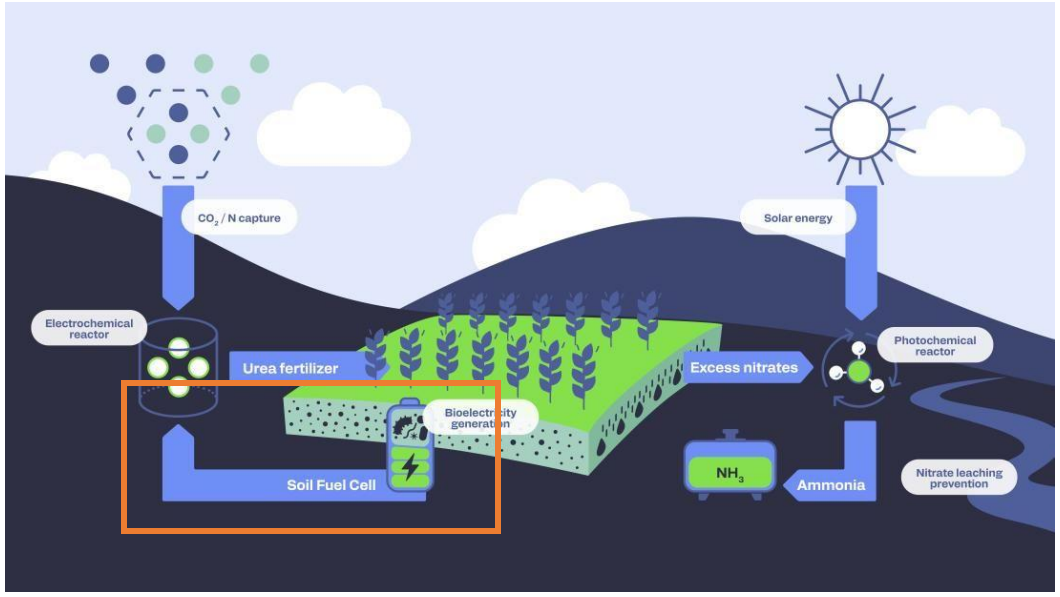


The CONFETI project aims to produce on-demand fertilizers through a self-sustaining technology that captures and converts CO_2 and N_2 into urea. As the system requires an input of electricity, a novel renewable energy source will be used: a soil microbial fuel cell (SMFC). This biobattery can produce energy from organic matter and microorganisms present in the soil.

In this project, the student will conduct an LCA of the biobattery to ensure that it effectively contributes to the environmental goals of the CONFETI project.

Main goal: To quantify the environmental impacts and benefits of the CONFETI biobattery to support the eco-design of the CONFETI technologies

MAIN TASKS:

1) To review the existing LCA literature on biobatteries
2) To collect life cycle data from project partners
3) To conduct a complete life cycle assessment of the biobattery
4) To suggest improvement actions for the eco-design of the biobattery

IMPORTANT:
Prospective students MUST have taken the Industrial Ecology course

European Innovation Council
Funded by the European Union
CONFETI
UAB Universitat Autònoma de Barcelona
sostenipra
ICTA-UAB

Research topic: Environmental impacts of the energy system in Bulgaria

- Research line: Sustainability modelling for the energy transition
- Research group: Sostenipra
- Support of: Applied Research and Communications Fund (ARC Fund Bulgaria)

CONTACT: cristina.madrid@uab.cat

Supervisors:
Miquel Sierra Montoya (ICTA-UAB)
Dr. Cristina Madrid López (ICTA-UAB)

In Bulgaria, fossil fuels continue to be an important source of energy: coal accounts for approximately 30% of the electricity generated, while natural gas retains significant importance, particularly for heating and industrial applications. However, the Bulgarian government has been exploring options for **offshore wind** development in the **Black Sea**, with an estimated potential of 116 GW.

In this Master Thesis, the student will analyse the **environmental impacts of the current Bulgarian energy system**, integrating **Life-Cycle Assessment and Social Metabolism**. The student will learn how to use Activity Browser, an open-source LCA software. This assessment will be the first step to later analyse environmental trade-offs of possible future energy systems based on wind in Bulgaria. The work will be carried out within the JustWind4All project, where the conducted research aims to accelerate on- and offshore wind energy through just and effective governance.

Research question: What are the environmental impacts of the energy system in Bulgaria?

MAIN TASKS:

1) Research on the current state of the energy system in Bulgaria (with support of ARC Fund Bulgaria).
2) Learn the open-source LCA software Activity Browser, with guidance of the supervisors.
3) Analyse the environmental impacts of the energy system in Bulgaria with emphasis in wind energy.
4) Write a peer-review paper for submission in a peer-review journal.

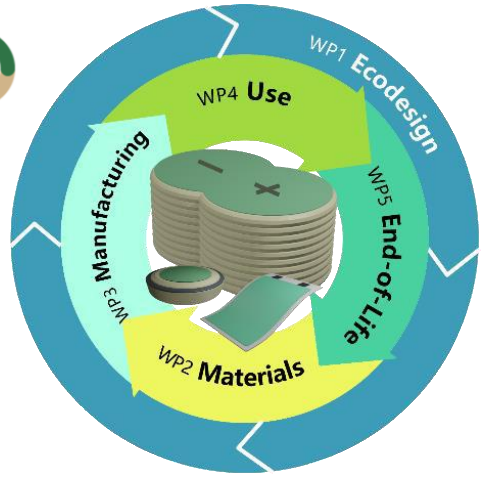
Research topic: The use of materials in new technology products (BID1)

- Research line: Resource management for a Circular Economy
- Research group: Sostenipra

CONTACT: laura.talens@uab.cat

Supervisor:
Laura Talens Peiró, PhD (ICTA)

BIDEKO



Implications and potentials of new biodegradable batteries to the current battery market

The BIDEKO project aims to develop a new generation of ecodesigned and biodegradable batteries to overcome the environmental impacts derived from current primary batteries. This imply not only to investigate in new manufacturing technologies for battery production but also understanding the current market for primary batteries, the application where they are used, and the materials demand and their sources.

The study will focus on **understanding the context of the conventional primary battery sector, the supply of the materials used and their potential demand in new technology applications**. The objective is also investigate the potential impact of the new BIDEKO batteries in the market, especially linked with single use devices.

Main goal: To investigate the current primary battery value chain and estimate the potential for new biodegradable batteries market.

MAIN TASKS:

1) To perform a literature review about primary batteries (i.e. chemistries, market share, environmental footprint, etc).
2) To understand main market applications and product volumes of current primary batteries
3) To identify potential market applications and viability of new BIDEKO batteries.
4) To gather information about current and potential batteries supply chains, including waste disposal scenarios and regulations.
5) To write a peer-review paper for submission in a peer-review journal.

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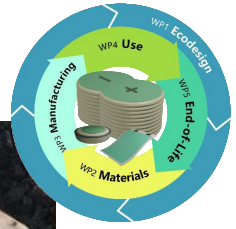
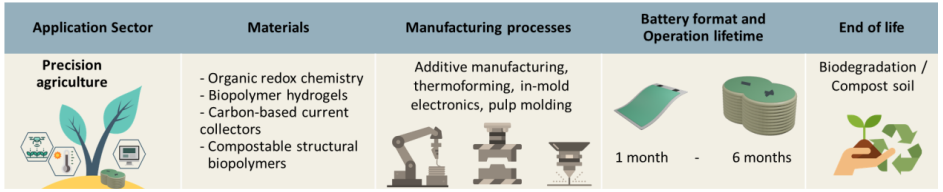
Research topic: The use of materials in new technology products (BIDEKO2)

- Research line: Resource management for a Circular Economy
- Research group: Sostenipra/GICOM

CONTACT: laura.talens@uab.cat

Supervisor:
Laura Talens Peiró, PhD (ICTA)
Raquel Barrena, PhD (DEBQA)
Teresa Gea, PhD (DEBQA)





A novel biodegradability indicator to support LCA indicators

In the transition to a circular economy, strategies to shift from technical to biological materials are progressively gaining importance. Biological materials have the advantage of being biodegradable and compostable. Current Life Cycle Impact Assessement (LCIA) does not include a specific indicator to capture the potential environmental benefits of using biological materials in new products.

In this Master Thesis, the student will **investigate the existing indicators for biodegradability** and **compostability**, their potential use as an impact category in LCA. In a second part of the work, the new indicator will be used to assess one battery prototype developed in the research project BIDEKO.

IMPORTANT:

Prospective students MUST have taken the Industrial Ecology course

Main goal: To develop an indicator to assess biodegradability using an LCA perspective

MAIN TASKS:

1) To perform a literature survey on indicators for biodegradability and compostability.
2) To review the methods used to develop an impact categories as those already included in LCIA methods (ie ReCiPe, WorldImpact, PEF).
3) To define the new biodegradability indicator, this could be derived from LCA or either the list of substances to be considered for biodegradability.
4) To apply the indicator in the analysis of one battery prototype developed in BIDEKO.
5) To write a peer-review paper for submission in a peer-review journal.

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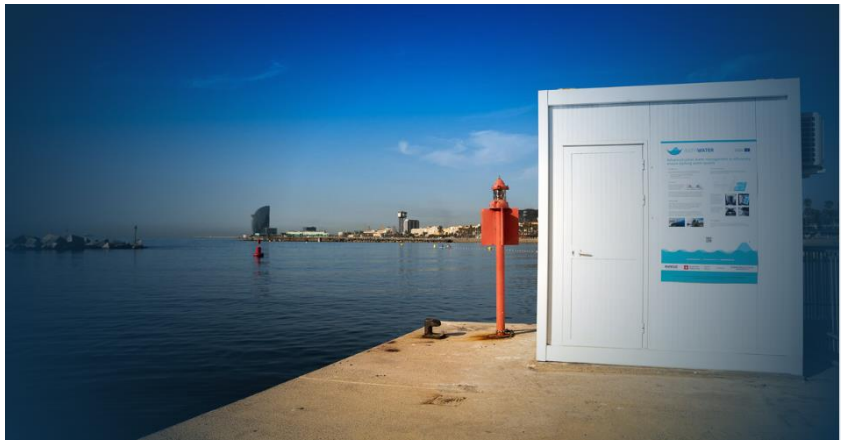
GICOM Grup d'Investigació en Compostatge Universitat Autònoma de Barcelona
sostenipra
ICTA-UAB

Research topic: Keeping beaches clean and safe – LCA and eco-design of a water sensor

- Research line: Resource management for a Circular Economy
- Research group: Sostenipra

CONTACT: anna.petit@uab.cat

Supervisor:
Laura Talens Peiró, PhD (ICTA)
Anna Petit Boix, PhD (ICTA)



Our beaches are closed to the public when there is an increase in microbiological pollution due to sewer overflows. For this reason, monitoring water quality is key to ensure that the population is safe and that a beach is not closed for longer than necessary. The company ADASA develops sensors that can continuously monitor water quality. However, we must ensure that the production of this sensor is not detrimental to other environmental goals.

In the context of the SPORE-MED project, this Master's thesis will support ADASA in the environmental evaluation of their product and propose eco-design strategies. The student will work in collaboration with ADASA to elaborate a comprehensive life cycle inventory of the product, with a particular emphasis on electronics. The thesis will compare diverse eco-design strategies and/or conventional manual sample-taking in the lab.

Main goal: To identify the environmental hotspots of a water sensor using life cycle assessment and to propose eco-design strategies

MAIN TASKS:

1) Create an inventory of components of the sensor
2) Evaluate the environmental impacts of the sensor
3) Define and evaluate eco-design strategies in collaboration with the company

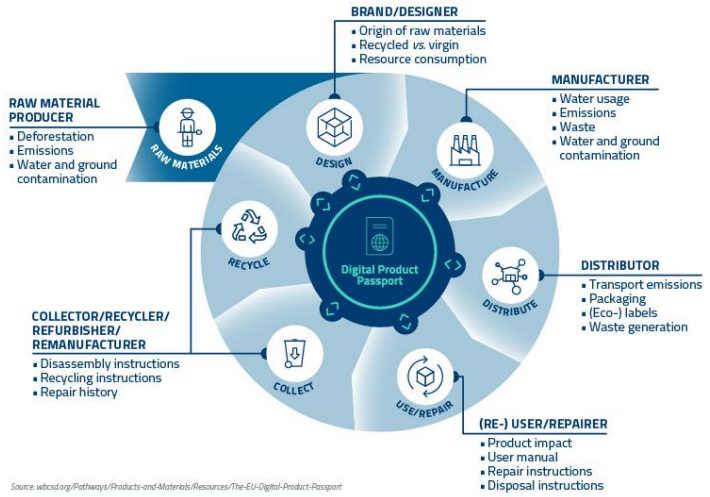
IMPORTANT:
Prospective students MUST have taken the Industrial Ecology course

Research topic: How are environmental data captured in product policies?

- Research line: Resource management for a Circular Economy
- Research group: Sostenipra

CONTACT: laura.talens@uab.cat

Supervisor:
Laura Talens Peiró, PhD (ICTA)
Xavier Gabarrell, PhD (ICTA)



Environmental data flows for circular economy

At present, it is not possible to transfer product data or environmental data between companies through messages based on automation or standards. E-invoicing standards do not currently include the data fields required by product passports. The project explores how product data can be transferred automatically along with messages from the financial administration and ERP systems to environmental management and reporting.

This TFM is part of a project due to be developed within the ECIU partners. The master will involve an initial literature survey, and most importantly the participation in facilitated workshops for collaborative innovation, between academia and public and private organizations.

Note: *This project may involve travelling to attend workshop in ECIU partner universities*

Main goal: To contribute to the development of EU-standardization, environmental data

MAIN TASKS:

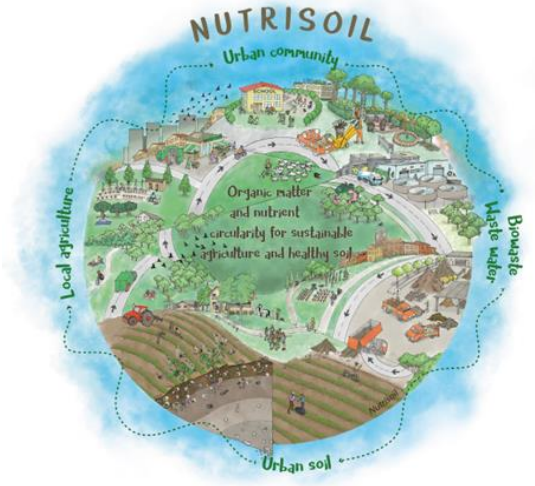
1) Research on the current state of data transfer and stardards on environmental data, especially regarding the Digital Product Passport (DPP) and Green Public Procurement (GPP).
2) Participate in joint workshop of the ECIU partner universities for planning of the experiments
3) Conduct focused experiments with selected partners and data, e.g. CO2 data along the e-invoicing
4) Joint workshop for sharing of the results
5) Write a peer-review paper for submission in a peer-review journal

Research topic: Nutrient and carbon circularity in urban and peri-urban agriculture: a comparative analysis of EU cities

- Research line: Nutrient and carbon circularity for waste management and soil regeneration in urban and peri-urban agriculture
- Research group: Sostenipra

CONTACT: erin.untereiner@uab.cat, juandavid.arosemena@uab.cat

Supervisor:
Erin Untereiner, MSc (ICTA)
Juan David Arosemena, Msc (ICTA)
Gara Villalba. PhD (ICTA)



Urban agriculture in the EU faces challenges in achieving nutrient and carbon circularity due to technical and socio-economic barriers. A key underlying issue is the poor state of urban and peri-urban soils, which hinders nutrient recovery and cycling. NUTRISOIL, a Proof-of-Concept project funded by URBAG, aims to address this by testing soil regeneration techniques using recovered organic matter and nutrients from compost and wastewater. These methods are designed to enhance soil health, improve nutrient cycling, and support sustainable urban agriculture.

This thesis will compare nutrient and carbon cycling practices across six EU cities of varying sizes and climates zones, analysing soil quality, agricultural practices, and resource management strategies. The goal is to identify the drivers and barriers to nutrient circularity and offer recommendations for improving urban agriculture.

Main goal: Systematically assess the current state of nutrient and carbon cycling in EU cities

MAIN TASKS:

1. **Geospatial analysis**: Mapping urban boundaries, cropland use, and soil quality across six EU cities.
2. **Data collection**: Gathering information on current agricultural practices, irrigation methods, and urban residue management, including the use of mineral/recovered fertilizers, circular nutrient strategies, and the involvement of relevant stakeholders.
3. **Comparative analysis**: Identifying and comparing the drivers and barriers influencing nutrient and carbon circularity across cities.
4. **Recommendations**: Providing insights and strategies for improving nutrient and carbon circularity in urban and peri-urban agriculture.

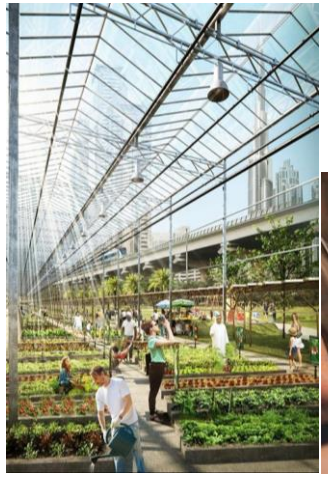
NUTRISOIL URBAG Integrated System Analysis of Urban Vegetation and Agriculture UAB Universitat Autònoma de Barcelona sostenipra ICTA-UAB

Research topic: Sustainable building certifications and indigenous & ecofeminist philosophies: fostering environmental stewardship

- Research line: Societal transformation for urban agriculture
- Research group: Sostenipra

CONTACT: erin.untereiner@uab.cat

Supervisor:
Erin Untereiner, MSc (ICTA)
Gara Villalba, PhD (ICTA)
Xavier Gabarrell Durany, PhD (ICTA)



People spend 80-90% of their time in buildings, which often last for generations. Many older buildings, designed without foresight, now require updates to meet modern EU efficiency standards. The buildings we construct today must withstand climate change and support future generations. Certifications like LEED, BREEAM, WELL, and SITES are increasingly recognized for promoting resource efficiency, occupant well-being, and the integration of urban agriculture, offering a way to reconnect occupants with nature and food systems.

This thesis will explore how urban agriculture in certified buildings can support ecofeminist and Indigenous philosophies, such as the Seventh Generation Principle, fostering environmental stewardship, cultural identity, and community cohesion. The research will assess whether these initiatives can drive societal transformation and influence wider urban sustainability and resilience practices.

Main goal: To explore how integrating urban agriculture into building design can support Indigenous philosophies and ecofeminism, fostering connections to nature and food systems while promoting environmental stewardship and societal transformation.

MAIN TASKS:

1. Review current certifications and the integration of urban agriculture
2. Investigate the relationship between indigenous and ecofeminism frameworks with urban agriculture and certifications
3. Conduct comparative case studies to evaluate the impact of building certifications with urban agriculture and social cohesion and sustainability
4. Critique current practices and propose recommendations

UAB Universitat Autònoma de Barcelona sostenipra ICTA-UAB

Research topic: Demand for second-hand textiles in Catalonia

- Research line: Resource management for a circular economy; used textiles
- Research group: Sostenipra

CONTACT: gemma.morell@uab.cat

Supervisors:
Gemma Morell Delgado (ICTA-UAB)
Laura Talens Peiró (ICTA-UAB)
Susana Toboso Chavero (TU Delft; EUR)

The growing need for a circular economy in the textile industry demands a deeper understanding of the balance between the supply and demand of textiles for reuse.

The student will survey the inhabitants of Catalonia, study their behaviour towards purchasing second-hand textiles, and estimate the current demand for second-hand textiles. These findings will be compared with the supply of post-consumer textiles available for reuse in Catalonia. The objective is to identify potential imbalances and opportunities to promote circularity within Catalonia's second-hand textile industry. The student will work with citizens and local stakeholders and will use data from the survey and textile flow studies to provide a comprehensive analysis.

Requirement: fluent Catalan or Spanish is a must!

Main goal: To promote the circularity of the current supply of post-consumer textiles for reuse in Catalonia

MAIN TASKS:

1) Conduct a literature review of survey-based studies on reuse practices among the population.
2) Map all second-hand shops of textile waste managers in Catalonia.
3) Design and conduct a survey with over 1,000 responses to study the population's behaviour towards purchasing second-hand textiles and to facilitate the estimation of the current demand for second-hand textiles.
4) Identify key areas for improvement by comparing the estimated demand volumes and other findings with the current and projected supply volumes of post-consumer textiles for reuse in Catalonia.
5) Write a peer-reviewed paper for submission to an academic journal.

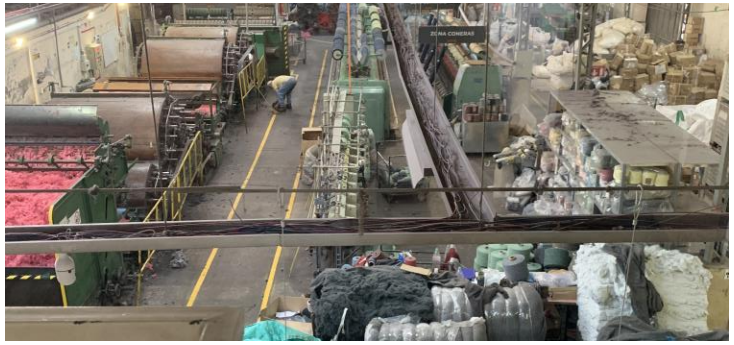
sostenipra ICTA-UAB

Research topic: Present and future recycling capacity of post-consumer textiles in Catalonia

- Research line: Resource management for a circular economy; used textiles
- Research group: Sostenipra

CONTACT: gemma.morell@uab.cat

Supervisors:
Gemma Morell Delgado (ICTA-UAB)
Laura Talens Peiró (ICTA-UAB)
Susana Toboso Chavero (TU Delft; EUR)



The growing need for a circular economy in the textile industry demands a deeper understanding of the balance between the supply and demand of textiles for recycling. This Master's thesis seeks to replicate the methodology of a study conducted in the Nordic countries, by analysing the capacity of enterprises and infrastructure in Catalonia to recycle post-consumer textiles.

The student will map enterprises in Catalonia engaged in recycling-related activities for post-consumer textiles and will estimate the current and forthcoming recycling capacities for recyclable post-consumer textiles. These findings will be compared with the supply of post-consumer textiles available for recycling in Catalonia. The objective is to identify potential imbalances and opportunities to promote circularity within the Catalan textile recycling industry. The student will work with local stakeholders and use data from interviews and textile flow studies to provide a comprehensive analysis.

Requirement: fluent Catalan or Spanish is a must!

Main goal: To promote the circularity of the current and future supply of post-consumer textiles for recycling in Catalonia

MAIN TASKS:

1) Conduct a literature review to understand textile recycling process and its stages.
2) Map all stakeholders involved in textiles recycling-related activities in Catalonia.
3) Classify the stakeholders according to the stage of the recycling process they are associated with, and the type of input material they use.
4) Conduct surveys and interviews with stakeholders to quantify the annual volumes currently processed, the volumes that could potentially be processed, and the expected volumes by 2030.
5) Identify key areas for improvement by comparing the estimated demand volumes and other findings with the current and projected supply volumes of post-consumer textiles for recycling in Catalonia.
6) Write a peer-reviewed paper for submission to an academic journal.

sostenipra ICTA-UAB

Research topic: Environmental and methodological assessment on BVOCs emissions in iRTG (integrated RoofTop Greenhouse)

Research lines: Boosting buildings climate resilience through water-energy-food nexus based solutions (WEF4Build)

Research group: Sostenipra

CONTACT: gaia.stringari@uab.cat

Supervisors:

Xavier Gabarrell Durany, PhD (ICTA), Gaia Stringari, PhD (ICTA)

The introduction of green systems indoors is growing due to multiple benefits recognized. However, large-scale greening can result in the release of substantial emissions of biogenic volatile organic compounds (BVOCs), which may affect indoor air quality. Preliminary studies found low BVOC accumulation indoors although few assessments were conducted. This research aims at the fine-tuning of a fast, reliable and easy-to-implement sampling protocol for BVOC emissions. The study will be carried out is an integrated rooftop greenhouse on aromatic plants grown under ***traditional*** and ***urban-waste fertilization***. The student will be in charge of the activities related to the greenhouse, the sampling and the post-sampling by means of chromatographic techniques (GC-FID). Results will be finally exploited for the determination of the **BVOCs emission factor** related to the investigated crops.

Main aim: BVOC emission protocol and monitoring to assess indoor green systems safety

MAIN TASKS:

1) Literature review on the emissions related with the cultivated species under the selected fertilization regimes and on the quali-quantitative determination of BVOCs.
2) Implementation of sampling a sample analysis to:
    I. Build up a robust sampling a post sampling protocol for BVOC emissions
    II. Quantitative assessment according to reference limits (ECA, EPA).
    III. Calculate the emission factors for the detected volatiles.
3) Elaborate a scientific article

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UAB Universitat Autònoma de Barcelona

Research topic: Comparative analysis of agronomic and environmental factors influencing soil GHG emissions from different fertilization methods

Research line: Nutrient and carbon circularity for waste management and soil regeneration in urban and peri-urban agriculture Research group: Sostenipra

CONTACT: guido.evangelista@uab.cat

Supervisors:
Guido Evangelista, MSc (ICTA)
Juan David Arosemena, MSc (ICTA)
Gara Villalba, PhD (ICTA)

The urban and peri-urban agricultural soils have been impoverished by the continuous application of fertilizers and received little or no organic matter (OM). The addition of nutrients to a carbon-deficient soil can be ineffective, since it hinders the health of the roots, affect the retention of water and nutrients and subsequently leads to a lower yield.
To overcome this problem, farmers could add urban residues such as pruning biomass together with recovered fertilizers from wastewater treatments plants (WWTP) to enrich the soil with OM and nutrients.
Fertilization type is one of the main factors responsible for emission rates of CO_2, CH_4, NH_3 and N_2O in agriculture.
This study aims to compare the emission factors (EF) obtained during two crop cycles with literature values from similar research and to investigate the agronomic and environmental practices that influenced the outcomes.

Main goal: compare the EF of the four gases with literature values and understand the main drivers of the emissions

MAIN TASKS:

1. Analyse the database of emissions and environmental values obtained during the past crop cycles
2. Prepare a literature review on EF values obtained by various crops and fertilization methods.
3. Compare the results of our experiments with values from the literature

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Proposals for UAB master students, year 2024-2025

Title of the thesis:
Analysing the approach to climate change vulnerability in the Province of Barcelona

Supervisors*:* Dragana Bojovic (dragana.bojovic@bsc.es) and Samuel Pickard (samuel.pickard@bsc.es)

Specialization of the master's program: Urban and Industrial Ecology, Ecological Economics

Description:

Climate change is increasing the intensity, frequency and duration of summer heatwaves around the world, and particularly in the Mediterranean region. Cities and their surrounding regions are hotspots of vulnerability, both because of their high population densities and because the way they are built leads to urban heat island effect, which further intensifies heatwaves. Barcelona is an example of a complex urban area where the increasing impact of heatwaves will uniquely affect its residents.

Objectives of the thesis and methodology:

Effectively adapting to heatwaves includes both short-term disaster preparedness measures that protect people's health and well-being, and long-term strategic decisions that (re)design the city of the future to be more climate resilient. But what interventions are needed, where and when are challenging questions to answer. An important aspect is understanding how to define and map vulnerability to assure that the measures support the most vulnerable population both in short and long term. The objectives of the thesis are to:

1. Conduct a literature review, including research articles, grey literature and public policy to summarise approaches to combatting vulnerability to increasing summer heat in the province of Barcelona
2. Analyse, assess and compare the proposed solutions in light of the latest climate change information (available at the Barcelona Supercomputing Center (BSC) from the ongoing climate services projects)
3. Recommend a framework for equitably building resilience to extreme summer temperature in Barcelona.

Expected results of the thesis:

The expected results of this master's thesis include a literature review and desk research summarizing various strategies for addressing vulnerability to increasing summer heat in the region. Additionally, the thesis aims to recommend a framework for equitably building resilience to extreme summer temperatures, ensuring that measures prioritize the needs of the most vulnerable populations. The findings will contribute valuable insights for policymakers and urban planners.

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