BETTER

Eté 2021_2

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CA SE PASSE CHEZ NOUS (INRAE news)

Métaprogramme BETTER

Appel à manifestation d'intérêt (projets exploratoires et consortia) :

- Prolongement des consortia 2020 : **au fil de l'eau (au plus tard 15 oct 2021)**.
- Nouveaux consortia : **au fil de l'eau**.
- Projets exploratoires (Vague 2022) : **15 oct 2021**.

Pour en savoir plus : intranet BETTER

Appel à demi-bourse de thèse :

- Date limite de dépôt : **suivez les instructions du département de l'encadrant**
- Date de l'arbitrage par le COPIL BETTER : f**in 2021 / début 2022**
- Date de début des thèses : **entre septembre 2022 et février 2023**

Les autres métaprogrammes

BIOSEFAIR - Favoriser la biodiversité et renforcer les réseaux de services écosystémiques.

- Appel à constitution de consortium : **au fil de l'eau (au plus tard 15 sept 2021).**
- Appel à manifestation d'intérêt (projets exploratoires) : **clos.**

CLIMAE - Agriculture et forêt face au changement climatique : adaptation et atténuation.

- Appel à manifestation d'intérêt (projets exploratoires et consortia) : **13 sept 2021.**

DIGIT-BIO - Biologie numérique pour explorer et prédire le vivant.

- Appel à manifestation d'intérêt (projets exploratoires et consortia) : **clos.**

HOLOFLUX - Holobiontes et flux microbiens au sein des systèmes agri-alimentaires.

- Appel à consortia interdisciplinaires : au fil de l'eau (au plus tard 1er sept 2021).
- Appel à manifestation d'intérêt pour des projets exploratoires : clos.

METABIO - Changement d'échelle de l'agriculture biologique.

- Appel à manifestation d'intérêt (projets exploratoires et consortia) : clos.

SANBA - Santé et bien-être des animaux en élevage.

- Appel à manifestation d'intérêt (projets exploratoires et consortia) : **20 sept 2021.**

SUMCROP - Gestion durable de la santé des cultures.

- Appel à manifestation d'intérêt (projets exploratoires et consortia) : clos.

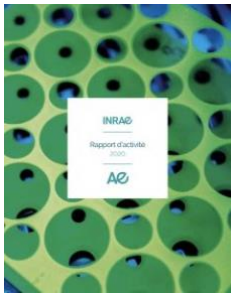
SYALSA - Systèmes alimentaires et santé humaine.

- Appel à manifestation d'intérêt 2021 (projets exploratoires et consortia) : clos.

Pour en savoir plus : intranet des métaprogrammes INRAE

Le rapport d'activité d'INRAE est disponible

Il rend hommage cette année à notre nouveau collectif, en revenant sur les faits marquants et défis relevés en 2020.



Le défi était triple :

- Consolider les fondations de l'institut et préparer notre nouvelle feuille de route, le plan stratégique INRAE2030 ;
- Continuer à mener des recherches au meilleur niveau mondial pour permettre de réelles avancées scientifiques ;
- Tout en s'adaptant à un contexte sanitaire compliqué.

https://intranet.inrae.fr/alimh/S-informer/A-lire-a-voir-a-savoir/rapport-d-activite-d-INRAE-2020?ticket=ST-1039425-VBoLXvlgnX3FkIRUqc0E-cas

Réseau REUSE INRAE

L'Assemblée Générale du réseau REUSE d'INRAE aura lieu à Montpellier du 18 au 20 octobre 2021.
Cette AG est organisée sous la forme de **5 ateliers répartis sur les 3 jour**s (attention, certains sont ouverts, d'autres réservés aux INRAE).
Vous trouverez toutes les informations utiles et le lien vers le formulaire d'inscription en consultant la page du site web du réseau dédiée à cet évènement: https://www6.inrae.fr/reuse/Programme-des-actions-et-animations/Assemblee-generale-2021
Sous réserve de disponibilité, la **date limite d'inscription est le 1er octobre.**

Autour de la bioéconomie - Séminaire du Département TRANSFORM – 28 septembre à partir de 18h au 1er octobre 2021

Le séminaire annuel du département TRANSFORM se déroulera du 28 septembre à partir de 18h au 1er octobre 2021 à l'Hôtel Plaza- Site du Futuroscope (Poitiers). Le séminaire est ouvert aux membres de TRANSFORM. Outre le nouveau SSD, les infrastructures liées à ce département seront présentées. Le préprogramme et le formulaire d'inscription sont accessibles ici.

Lancement depuis le siège INRAE du 2e Plan national pour la science ouverte

Le 6 juillet au siège d'INRAE, la Ministre de la Recherche Frédérique Vidal a présenté le 2e plan national pour la science ouverte (PNSO) qui s'inscrit dans une ambition européenne. Une plateforme nationale des données de la recherche, « Recherche Data Gouv » va être créée dont le pilotage est confié à INRAE. Le replay de l'événement est en ligne est accessible ici.

Rendez-vous – Agenda

Conférence Circular@WUR : Living within planetary boundaries 6-8 décembre 2021 à Wageningen Campus

Les inscriptions sont ouvertes. Nous vous rappellone qu'une session de Partnerships : « Local and circular valorization of urban biowaste – challenges and benefits for more resilient cities » proposée par Sophie Thoyer et Anne Trémier toutes deux members du COPIL BETTER aura lieu Durant cette conférence.
https://www.wur.nl/en/Research-Results/Research-programmes/Research-investment-programmes/Circular-and-climate-neutral/CircularWUR.htm

Carnot 3BCAR - Bioénergies, Biomolécules et matériaux Biosourcés du CARbone Renouvelable

Le Carnot 3BCAR organise son Forum Recherche-Industrie 2021sur la thématique des matériaux biosourcés le Jeudi 14 octobre 2021 à Paris. https://event.3bcar.fr/fr/page/accueil/

Re-thinking Packaging for Circular & Sustainable Food Supply Chains of the Future 26-29 septembre 2021 on line (CIRCUL-A-BILITY)

CA19124 - RETHINKING PACKAGING FOR CIRCULAR AND SUSTAINABLE FOOD SUPPLY CHAINS OF THE FUTURE "CIRCUL-A-BILITY" (action COST) organise son premier meeting.
Le programme est disponible ici.
Inscription 100 euros ici

NDLR : Les sessions 5,6,7 et 8 peuvent contribuer aux thématiques BETTER
1 seul français dans le CS : Frederic Debeaufort, Professor, University of Burgundy – Institute of Technology – Dpt BioEngineering 7 Blvd Docteur Petitjean – BP 17867 - 20178 Dijon Cedex, UMR PAM
Emballages comestibles (films ou enrobages) et depuis 3 ans sur les emballages bio-sourcés (biopolymères naturels: protéines et/ou polysaccharides, associés ou non à des lipides) pour des applications comme films biodégradables et actifs. C'est en

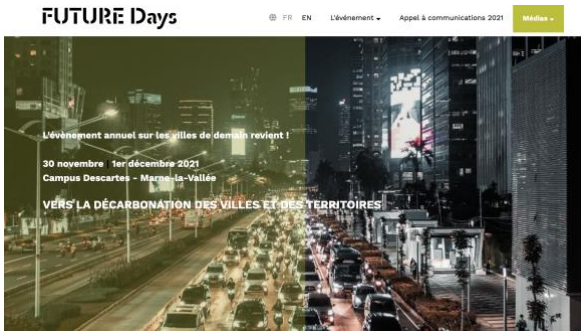
particulier l'étude de leur efficacité à ralentir les transferts de matière, soit au sein même de l'aliment, soit entre le produit alimentaire et son environnement (approche intégrée)

3ème édition de l'Ecole d'été « Autour du 2°C - le nexus Eau - Sols - Énergie – Alimentation » Autrans (Isère), 19 au 24 septembre 2021

La troisième édition de l'école d'été "Autour du 2°C" se déroulera du 19 au 24 septembre 2021 à Autrans (Isère, environs de Grenoble) date limite d'inscription au **31 août 2021.**
https://www.univ-grenoble-alpes.fr/edition-2021/
Les frais d'inscriptions à l'école d'été sont fixés à :
340 € pour les doctorants.
680 € pour les chercheurs ou enseignants chercheurs, postdoctorants, ingénieurs de recherche, ingénieurs d'étude.
Prise en charge par les tutelles : la participation des doctorants CNRS, INRAE et IRD est entièrement prise en charge, ainsi que celle des post-doctorants ou chercheurs appartenant au CNRS ou à INRAE.
L**e thème retenu pour cette édition porte sur le nexus "Eau - Sols - Énergie - Alimentation"** qui se trouve au cœur des politiques à mener et des stratégies à mettre en œuvre, aussi bien pour atténuer le réchauffement climatique que pour en limiter les impacts ou définir des trajectoires d'adaptation. Cet événement est soutenu par le CNRS, l'IRD, INRAE, l'Institut Pierre Simon Laplace et l'Université Grenoble Alpes.

FUTURE Days -« Vers la décarbonisation des villes et des territoires ». 30 novembre et 1er décembre 2021 à Marne la Vallée - Campus Descartes

Portée par l'**Université Gustave Eiffel,** en partenariat avec Paris-Est Sup et l'École des Ponts ParisTech, les FUTURE Days traiteront du thème « la ville et les territoires décarbonés ».
Les appels à communications sont closes (18 juillet 2021).
Les communications attendues interrogeront par conséquent la décarbonation des villes et se positionneront dans les sessions suivantes :
S1 : **les leviers, technologiques, sociaux,** politiques, économiques, réglementaires…, de la décarbonation des villes et des territoires
S2 : l**a mesure des consommations, des émissions et de l'empreinte des villes et des territoires**
S3 : la gouvernance multi-échelles et inclusive de la décarbonation des villes et des territoires, y compris la dimension sociale de la décarbonation
S4 : les dimensions historiques de la décarbonation des villes et des territoires, et leurs corollaires
S5 : la comparaison internationale des trajectoires de décarbonation des villes et des territoires
S6 : **les liens entre décarbonation des villes et leur environnement**
S7 : l'acceptabilité des politiques et mesures de décarbonation.



https://www.futuredays.fr/appel-a-communications-2021/

Les inscriptions ne sont pas ouvertes pour l'instant (01/09/2021)

Bon à savoir

Parution

Bio#Futures (2021)

Discusses the fast-approaching wave ("bio-tsunami") of socio-technical transformation brought about by new applications of biosciences and biotechnologies
Presents foresight mapping of the future of the bioeconomy by exploring the convergence of technological and innovation waves
Includes bioscience and biotechnology applications in agriculture, food, health, energy, sustainability, and education.
This volume presents a timely recognition, warning and mapping of the fast approaching wave, or “bio-tsunami”, of global socio-technical transformation, built by a much wider spectrum of converging powers, including biotechnology, new agriculture, novel foods, health, quality of life, environment, energy, sustainability, education, knowledge management, and design of smart applications. The book contains eight sections et 27 chapitres. ISBN: 978-3-030-64969-2

Keywords

Biotechnology Bio-tsunami Biomedicine Food security Green economy Artificial neural networks Bioethics Human learning

Quelques chapitres :

A Systematic Approach for Assessing and Managing the Urban Bioeconomy
Technological Landscape of the Agriculture and Food Sector: A Long-Term Vision
Inclusion and Resilience in the Bioeconomy

VEILLE BETTER

Projets relatifs à la bioéconomie pour les territoires urbains

BLOOM – Europe – H2020

H2020
EU contribution € 2 400 000
Start date 1 November 2017
End date 31 December 2020

BLOOM is an EU Coordination and Support Action implemented from 2017 to 2020. The project aims at bringing together partners from across Europe t**o debate, communicate, and engage the public in the potential of bioeconomy.**
https://bloom-bioeconomy.eu/
https://cordis.europa.eu/project/id/773983

NDLR : Ce projet est terminé, les attendus devraient être rapidement disponibles.
Certains documents sont dans cordis :
Bioeconomy mapping, report : An overview of the bioeconomy ici

School box Bioeconomy ☺
Compilation of stakeholder targeted materials, final Overview of dissemination material

HOOP – Europe – H2020

H2020
Contribution de l'UE € 7 994 989,13
Date de début 1 Octobre 2020
Date de fin 30 Septembre 2024

The HOOP project supports 8 lighthouse cities and regions in developing large-scale urban circular bioeconomy initiatives that will focus on making bio-based products from urban biowaste and wastewater. The HOOP Urban Circular Bioeconomy Hub will create an online platform to foster knowledge exchange and replication in cities and regions across Europe. HOOP will provide Project Development Assistance (PDA) to Albano-Laziale (Italy), Almere (The Netherlands), Bergen (Norway), Kuopio (Finland), Münster (Germany), Murcia (Spain), Porto (Portugal), and Western Macedonia (Greece).
https://hoopproject.eu/about/
https://cordis.europa.eu/project/id/101000836

WaysTUP! - Europe – H2020

H2020
Contribution de l'UE € 9 348 929,35
Date de début1 Septembre 2019
Date de fin28 Février 2023

WaysTUP! project aims to establish new value chains for urban bio-waste. The project will display a range of new products produced from urban bio-waste to bio-based processes starting from different feedstocks, including fish and meat waste, spent coffee grounds, household source-separated bio-waste, and used cooking oils. The project is expected to produce a behavioral change in citizens and local communities, improving and changing longstanding perceptions of urban bio-waste during its implementation. This will overall contribute to a more circular economy.
https://waystup.eu/about/
https://cordis.europa.eu/project/id/818308/fr

NDLR : Ce projet en cours comporte une volet Insect ! (Université d'Alicante, Espagne)

	Feedstock type	Technology solution/PILOT	End-products
VALUE CHAIN 5.	Source separated biowaste	Insect breeding/ PILOT 3	Protein-rich flour for feed
	Feedstock providers	Technology solution providers	End-user/Industry
	SAV	UA	Feed industry

Généralités - Bioéconomie et économie circulaire

Poser les jalons de la ville bas carbone pour tous : la Fondation Palladio et La Fabrique de la Cité lancent l'Université de la Ville de Demain

Le premier sommet de l'Université de la Ville de Demain (UVD) a réuni les 8 et 9 juillet 150 responsables politiques, économiques, associatifs et personnalités issues de la société civile. Vous trouverez ici (Le Monde, Publié le 19 juillet 2021) les conclusions de cette université si vous êtes abonné(e)s.

L'Université de la Ville de Demain a été organisée par :

- La Fondation Palladio créée en 2008, sous l'égide de la Fondation de France, autour de l'enjeu majeur du 21e siècle qu'est la construction de la Ville et des lieux de vie (propose des financements mais appel clos pour cette année depuis mi- mars)
- La Fabrique de la Cité, think tank dédié à la prospective et aux innovations urbaines créé par le Groupe Vinci en 2010. L'ensemble de ses travaux est public et disponible sur son site web et les réseaux sociaux.

En rassemblant des décideurs économiques et politiques, des chercheurs-experts, des représentants de la société civile et des médias, l'**Université de la Ville de Demain (UVD)** veut appeler les acteurs de la ville, qui portent une responsabilité commune, à s'unir pour faire face à aux enjeux inédits relatifs aux tensions du siècle exprimées en, par et pour les villes qu'elles soient démographiques, sociales, économiques, et à coopérer pour faire émerger les solutions de demain.
À la suite d'auditions d'experts qui ont permis de construire un consensus sur les enjeux et défis à relever, quatre groupes de travail ont vu le jour :

- Habiter la ville bas carbone : À quoi ressemble la ville bas-carbone ? Comment s'y déplace-t-on ? *Comment y consomme-t-on ?* Comment y habite-t-on ? Si de nombreuses pistes d'action existent déjà pour les centres-villes et les métropoles, t*el n'est pas le cas pour le périurbain et les villes moyennes.*
- Financer la ville bas carbone : Quel risque exact fait peser le changement climatique ? L'incertitude qui entoure cette question crée une tension entre le coût certain de l'action et le coût incertain de l'inaction, entre le choix du business as usual e*t celui de la transition.* Comment financer les actions d'adaptation au changement climatique et d'atténuation dans le respect de la justice sociale et spatiale ?
- Gouverner et co-construire la ville bas carbone : Une vision commune de la ville bas-carbone affranchie d'un discours de peur et de culpabilité peine à émerger. Or il est connu que l'efficacité sur le long terme d'une telle vision est faible. Comment élaborer cette vision commune ? Sur quels fondements la faire reposer ? Comment s'assurer que les pistes d'action créent l'adhésion nécessaire et profitent à tous ?
- Intégrer les émissions indirectes dans sa stratégie bas carbone : Les émissions indirectes sont celles qui, pour être réduites, *exigent de mettre en place les plus fortes relations partenariales entre territoires et entre acteurs.* En quoi les stratégies de réduction des émissions des entreprises participent-elles à celle d'un territoire ? En quoi agir avec les territoires aide-t-il les entreprises à intégrer le scope 3 dans leur stratégie de neutralité carbone ?

> NDLR : En rassemblant des décideurs économiques et politiques, des chercheurs-experts, des représentants de la société civile et des médias, l'**Université de la Ville de Demain** (UVD) veut appeler les acteurs de la ville, qui portent une responsabilité commune, à s'unir pour faire face à

aux enjeux inédits relatifs aux tensions du siècle exprimées en, par et pour les villes qu'elles soient démographiques, sociales, économiques,et à coopérer pour faire émerger les solutions de demain. L'UVD dit vouloir proposer un mode inédit de coopération en brisant les silos, en favorisant le dialogue et en embarquant toutes les parties prenantes dans un processus de travail et d'engagement collectif.
Parmi les questions posées, certaines concernent les interrogations de BETTER et relèvent des approches interdisciplinaires mises en œuvre.
Pour en savoir plus :
Les compte rendus d'expert sont disponibles au téléchargement, à titre d'exemple
https://www.fondationpalladio.fr/download/UNIVERSITE_VILLE_%20DE_DEMAIN_2EME_AUDITION_CR_2.pdf
https://www.fondationpalladio.fr/download/UNIVERSITE_VILLE_%20DE_DEMAIN_1ERE_AUDITION_CR_2.pdf

Fritsche, U., Brunori, G., Chiaramonti, D., Galanakis, C.M., Matthews, R. and Panoutsou, C., Future transitions for the Bioeconomy towards Sustainable Development and a Climate-Neutral Economy – Bioeconomy Opportunities for a green recovery and enhanced system resilience, Borzacchiello, M. T., Sanchez Lopez, J. and Avraamides, M. editor(s), Publications Office of the European Union, *Luxembourg, 2021, ISBN 978-92-76-28415-4, doi:10.2760/831176, JRC123534.*

https://publications.jrc.ec.europa.eu/repository/handle/JRC123534

This report has been elaborated on behalf of the European Commission's Knowledge Centre for Bioeconomy..
Abstract: The linkages of the bioeconomy to post-pandemic recovery with regard to impacts and possible responses are currently being discussed by many institutions and initiatives, even though there is currently limited data on the impact of the pandemic on the bioeconomy. This report presents preliminary results based on initial analysis from the authors on knowledge synthesis on the EU bioeconomy system, trends, and perspectives of the future development towards 2030 and 2050.
Série Future transitions for the Bioeconomy towards, Sustainable Development and a Climate-Neutral Economy

Paiho, S. et al., 2021. Creating a Circular City–An analysis of potential transportation, energy and food solutions in a case district. Sustainable Cities and Society, 64 (March 2020).

Abstract: Circular economy plays a central role in cities on a strategical level. However, concrete circularity plans and actions remain rare. This **paper examines how a city district could target circularity with transportation, energy and food solutions.** The analysis is performed for **an existing case district in a planning phase**. The aim is to provide real concrete examples. **Firstly,** technological alternatives and their energy and carbon emissions are analyzed numerically. **Secondly,** service solutions for each technology are suggested. **Thirdly,** relevant regulations are framed. In the analyzed district, high-level circulation of urban streams is unlikely to occur. Almost carbon-free transportation is possible, resulting in extensive increase in local electricity demand. Locally produced biogas would contribute about 20 % of the gas demand of the most advanced transportation scenario. None of the several energy production alternatives would lead to local energy self-sufficiency. Waste heat recovery from a data center and a wastewater treatment plant could supply 58 % of the heat demand. 6 % of the food consumed could be produced locally. **T**he paper highlights the importance of **considering interlinkages between different streams and sectors, revealing the complexity of a circular city. The analysis demonstrates that circularity in this district is possible, but requires multidisciplinary analysis.**
https://www.sciencedirect.com/science/article/pii/S2210670720307459

Villes – bioproduits – constructions

Göswein, V. et al., 2021. Land availability in Europe for a radical shift toward bio-based construction. Sustainable Cities and Society, 70 (April 2021).

Abstract: The renovation and construction of buildings presents an opportunity for climate change mitigation in urban environments. **Bio-based construction is particularly promising since the plant's sequestered carbon offsets the building's carbon emissions.** However, the **required land to cultivate suitable biomass and the feasibility of environmentally sustainable materials for resilient cities should be understood**. This study analyzes timber, straw, hemp and cork construction and renovation in Europe. A prediction-based model, tuned-up on four systems (built environment, natural environment, carbon balance, industrial processing), converts construction activities until 2050 into required material, embodied land and carbon storage. **A novel material-**

land nexus concept analyzes the required land for bio-based construction. Land transformation is not analyzed. The aim is to evaluate the biomass supply considering the current cross-sectoral use of land in Europe. **The results indicate that current forests and wheat plantations are more than sufficient for supplying construction materials. Straw seems better than timber, in terms of resource availability and carbon storage potential. Cork is only favorable locally in southern dry countries**. The current legal limitations hinder hemp's potential at a large scale. A wider application of bio-based materials remains unrealistic until an appropriate legal framework is provided.

Mots clés : building, material, biobased, city construction

Villes et Waste

Taffuri, A. et al., 2021. Integrating Circular Bioeconomy and Urban Dynamics to Define an Innovative Management of Bio-Waste: The Study Case of Turin. SUSTAINABILITY, 13 (11). https://www.mdpi.com/2071-1050/13/11/6224

Abstract: Bio-waste could play a fundamental role in reaching the **EU target to recycle 65% of municipal waste by 2035**. The European waste policies and the Green New Deal are increasingly focusing on bio-waste enhancement, in particular within **the Bioeconomy Strategy and the Circular Economy Package.** Circular bioeconomy (CBE) combines these perspectives, with an increasing focus on organic flows extension and enhancement along the economic cycle. This paper analyses the **potential of the CBE paradigm to improve the treatment of the organic fraction of the municipal solid waste (OFMSW), taking the Metropolitan City of Turin (MCT)** as a case study. Our results indicate that the currently used OFMSW plant capacity of MCT is insufficient with respect to the need for treatment and, above all, inadequate for future demand trends. We advance an analysis of different CBE-related projects, which contribute to the creation of a feasible environment for bio-based closed loops in Turin. In particular, RePoPP (Porta Palazzo Organic Waste Project) is proposed as an instance of a systemic and circular process that could be improved by following the CBE principles. Through **the use of qualitative system dynamics**, we propose a decentralised alternative MSW management **scenario with a micro anaerobic digestion plant at its core.** A stakeholder analysis through a power-interest matrix identifies actors that are key to enabling this scenario. The sustainable pathways proposed in this paper can inspire local-level policy design and therefore contribute to the creation of new systemic food and waste policies for the city through the CBE paradigm.

Mots clés : Biowaste, municipal, Turin, Italy, scenario, qualitative system dynamics

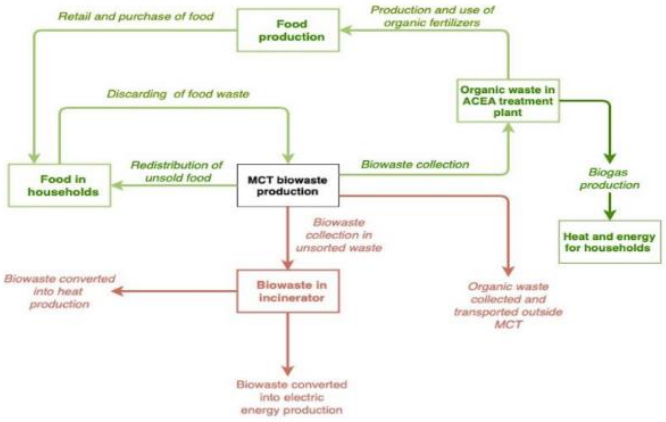


Figure 2. Stock and flow diagram of the organic waste management in the Metropolitan City of Turin; the boxes represent the stocks, and the arrows depict the flows. Green loops are the circular part, while the red ones represent losses or less efficient processes related to biowaste treatment and enhancement.

Villes – bioéconomie et santé

Donald McNeill, 2021. Global cities and the bioeconomy of health innovation. In M. Lancione & C. McFarlane, eds. Global Urbanism Knowledge, Power and the City. London, UK: Routledge, p. 8.

https://www.routledge.com/Global-Urbanism-Knowledge-Power-and-the-City/Lancione-McFarlane/p/book/9780367745349

Abstract: This chapter discusses the relationship between **global urbanism and public health,** providing a schematic overview of some key urban theoretical approaches to health in global cities. It *sketches the rise of the*

bioeconomy, the creation of a global medical economy based around pharmaceuticals and medical service expertise. The chapter focuses on the work such as Aihwa Ong's Fungible Life* to consider how the globalisation of health research and development, particularly around genetics, has a spatial logic in the active sites of knowledge production. It then sketches a moral urban economy around such innovation milieu and the relationships between venture capital and new health products. **The other side of the global urban economy is the field of health innovation, which is strongly associated with biomedical and bioengineering venture capital investment.** This sub-sector of the economy offers potentially lucrative returns to investors through patented drug discovery, covering a wide range of medicines and diagnostic intervention infrastructure, such as scanners and blood tests.

Mots clés : global urbanism, public health

* revue du livre https://pacificaffairs.ubc.ca/book-reviews/fungible-life-experiment-in-the-asian-city-of-life-by-aihwa-ong/

Villes – Système – flux

Bahers, J.B., Barles, S. & Durand, M., 2019. Urban Metabolism of Intermediate Cities: The Material Flow Analysis, Hinterlands and the Logistics-Hub Function of Rennes and Le Mans (France). *Journal of Industrial Ecology*, 23(3), pp.686–698.

https://halshs.archives-ouvertes.fr/halshs-02195025

Abstract: Although **urban metabolism** has been a subject of renewed interest for some years, the related studies remain fragmented throughout the world. Most of them concern major cities (megacities and/or national capitals) and, more rarely, intermediate, medium-sized or small cities. **However, urbanization trends show that together with the metropolization process, another one is characterized by the proliferation of intermediate cities.** We have studied the **metabolism of two French intermediate cities for the year 2012: Rennes Métropole (400,000 inhabitants) and Le Mans Métropole (200,000 inhabitants).** To this end, we used **material flow analysis (MFA) based on the methodology developed by Eurostat, adapted to the subnational level.** This has been made possible by the use, for the first time, of very precise statistical sources concerning freight. We have developed a multiscale approach in order to weigh the urban metabolism of those two cities and to compare it to other cases and larger territories. **This allows a better understanding of the specific territorial metabolism of intermediate cities, their hinterlands, and their logistics-hub function**. We conclude with the "urban dimension" of social metabolism, and, thanks to the multiscale approach, to the debate regarding logistical hubs, dematerialization, and territorial autonomy.

Mots clés : city flow analysis; city-region; France, periurban, multiscale approach

Moschitz, H. & Frick, R., 2021. City food flow analysis. A new method to study local consumption. Renewable Agriculture and Food Systems, 36(2), pp.150–162.

Abstract: The aim of this paper is to **present and discuss a new approach to assess a city's supply with food from the nearby region: the city food flow analysis**. In view of the growing challenges of the global food system, the **local level has increasingly been identified—both by citizen-consumers and city administrations—as a relevant scale to develop sustainable alternatives.** Although different actors often agree on the aim to increase local food supply, the discussions and initiatives convey the lack of knowledge and data about the actual origin of food supplied to cities. Without knowing where food comes from and through which channels it reaches the consumer, it is difficult to develop alternatives that could eventually change the food system. This **paper presents and discusses the city food flow analysis as a methodology to close this lack of information.** It consists of **a four-step approach that leads to a clear picture on the local food production around a city, the consumption of local food in a city and the importance of different supply chains for local food in the city, including retail and gastronomy.** The methodology is illustrated with the example of two cases (cities). The city food flow analysis provides detailed information about the current situation of urban food provisioning, which city stakeholders can use to start an informed discussion process about necessary changes in the food system, re-embedding of cities into their territorial context. However, data are not always fully available, which is a result in itself that illustrates the challenges of re-localizing local food provisioning. (Demande pdf à auteur le 24/08/2021)

https://www.cambridge.org/core/article/city-food-flow-analysis-a-new-method-to-study-local-consumption/FD948014C0D3B0055745CEB6918DA0BC.

Mots clés : city food flow analysis; city-region; local consumption; local food; regional food supply

Stelwagen, R.E. et al., 2021. A bottom-up approach to model the environmental impact of the last-mile in an urban food-system. **Sustainable Production and Consumption, 26, pp.958–970.**

Abstract: Addressing **urban consumption and the inherent environmental impacts** is considered indispensable for climate change mitigation. However, city-specific insights in urban food-systems are often missing. This study uses a novel bottom-up approach to evaluate the environmental impact of the last-mile of consumers within the food-system. Primary data was gathered by means of a survey (N=663) to model the last-mile, which was combined with secondary data sets, largely from regional studies. Jointly, they informed **our hybrid Urban Metabolism - Life Cycle Analysis (UM-LCA) model**. This model allowed us to a**ssess the likely environmental impacts of the food-system on global warming, freshwater quality and land use, in relation to urban food consumption behaviour.** In our case study, we found that **last-mile movements of consumers account for as much as 5.3-5.8 percent of the food-system's total global warming potential**. This is a considerable share, especially in proportion to the impact share of all other transport for distribution in the system (11.5-15.6 percent). This is a result of the numerous shopping trips, and while the majority of visits is almost equally shared by motorized and active modes, the vast majority of kilometres for the last-mile is travelled by motorized modes (68.2 percent). Furthermore, interesting differences could be found **between city districts in terms of transport modes used by households resulting in different last-mile impacts, which is relevant to explore further for potential policy interventions to stimulate active modes.** F**ood will inevitably get on the urban agenda**, and therefore it is important to gain city-specific insights in relation to urban food consumption and its impacts. This study confirms that the influence of consumer choices is considerable and therefore it is worth further mapping these to develop adequate sustainability strategies. We argue that **the bottom-up approach provides for both a measuring and monitoring tool, as well as an evaluation tool of urban policy and design towards more sustainable food systems.**

https://doi.org/10.1016/j.spc.2020.12.039
Mots clés : hybrid Urban Metabolism - Life Cycle Analysis (UM-LCA) model, food, urban food consumption, impacts

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Wirth, M. et al., 2021. Potential Nutrient Conversion Using Nature-Based Solutions in Cities and Utilization Concepts to Create Circular Urban Food Systems. Circular Economy and Sustainability.

Abstract: The present food system is characterized by **a linear flow of resources from rural areas into cities, where most food is consumed and essential nutrients discharged as wastewater**. **Limited water and phosphorus resources and large carbon footprints of chemical fertilizers drive increased recovery of water and nutrients for reuse in agriculture**. Alongside end-of-pipe technologies at conventional wastewater treatment plants, nature-based solutions provide a robust and low-energy alternative solution. This paper assesses the **potential of treatment processes using NBS to close water and nutrient cycles in the urban food system. A Substance Flow Analysis approach** is used to **quantify the recoverable urban nutrient (nitrogen, phosphorus, potassium) budget contained in household wastewater and biodegradable kitchen waste, using the city of Vienna, Austria, as an example.** The developed model reflects the **metabolization of water and nutrients by treatment wetlands and biogas digesters into fertigation water and fertilizer.** It differentiates between specific crop nutrient requirements and yields, and by greenhouse and outdoor farming conditions in a temperate climate. Results indicate that, using NBS, the wastewater and kitchen waste from 77,250 persons could fully cover the nitrogen and phosphorus fertilizer demand of the entire vegetable production in Vienna, which currently supplies one-third of Vienna's vegetable consumption. Additional people connected to the system can supply

significant excess nutrients to produce other crops within and beyond the city. **The model can inform selection and design of NBS for nutrient recovery and reuse, and support integrated planning regarding use of secondary nutrient sources and optimization of secondary nutrient utilization.**
Mots clés : Circular economy . Urban food system. Nature-based solutions. Resource recovery. Urban planning . Urban wastewater

Villes – Water

Quesnel, K.J., Agrawal, S. & Ajami, N.K., 2020. Diverse paradigms of residential development inform water use and drought-related conservation behavior. Environmental Research Letters, 15(12).

Abstract: Widespread urbanization has led to **diverse patterns of residential development, which are linked to different resource consumption patterns, including water demand.** Classifying neighborhoods based **on urban form and sociodemographic features** can provide an avenue **for understanding community water use behaviors associated with housing alternatives and different residential populations.** In this study, we leveraged built environment data from the online real estate aggregator Zillow to develop neighborhood typologies and community clusters via a sequence of unsupervised learning methods. Five distinct clusters, spatially segregated despite no geospatial inputs, were associated with unique single-family residential water use and conservation patterns and trends. The two highest-income clusters had divergent behavior, especially during and after a historic drought, thus unraveling conventional income-water use and income-water conservation relationships. These clustering results highlight evolving water use regimes as traditional patterns of development are replaced with compact, water-efficient urban form. **Defining communities based on built environment and sociodemographic characteristics, instead of sociodemographic features alone, led to 3% to 30% improvements in cluster water use and conservation cohesion.** These analyses demonstrate the importance of smart development across rapidly urbanizing areas in water-scarce regions across the globe.
Mots clés : urbanization, water demand, water conservation, clustering

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Mots clés : Circular economy . Urban food system. Nature-based solutions. Resource recovery. Urban planning . Urban wastewater,