



Using Urine-Based-Fertilizers (UBF) in urban and suburban agricultures

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laboratoire eau environnement systemes urbains



PLAN

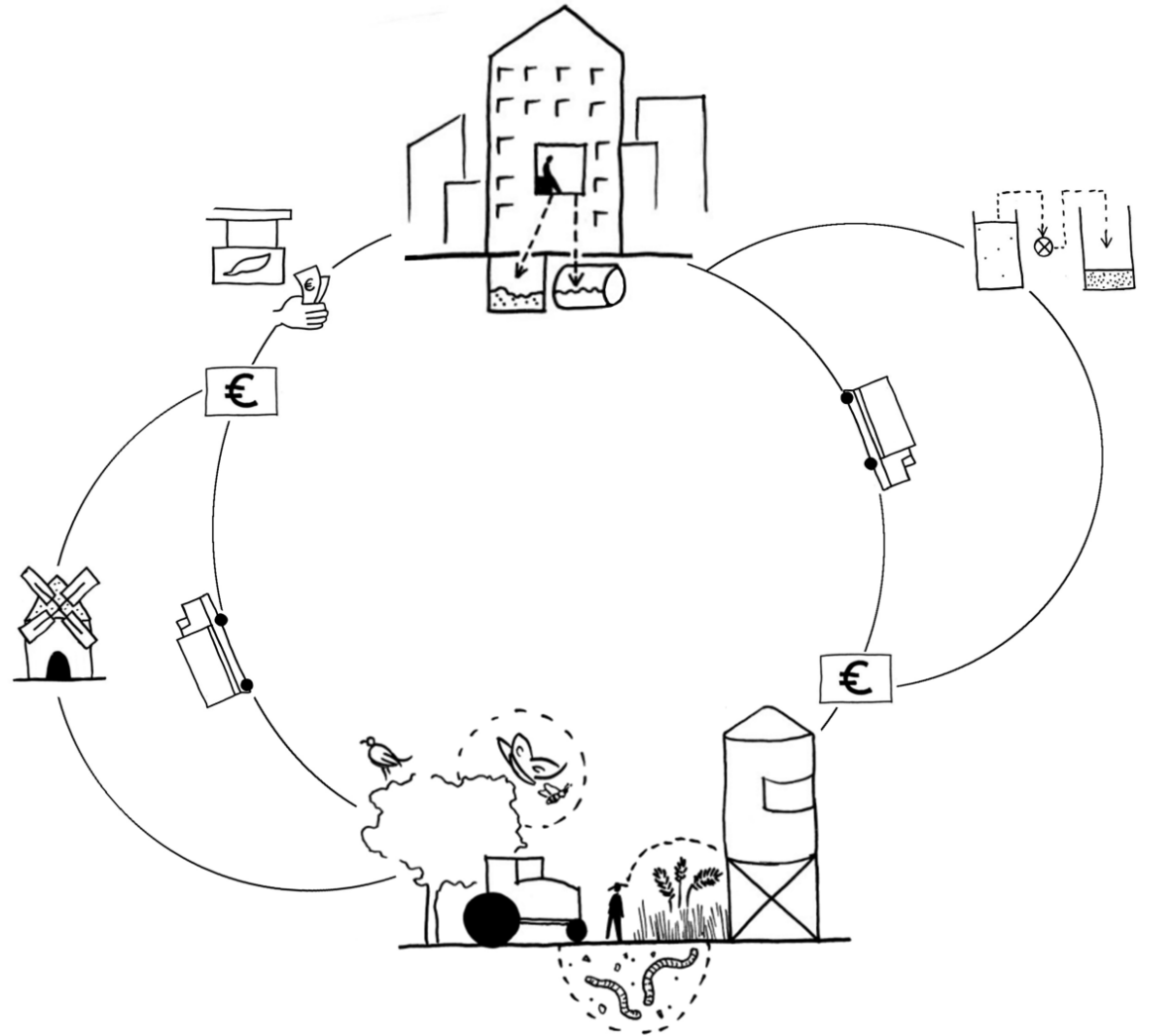
- I. Context
 - a. Why working on UBF in urban agriculture?
 - b. Corpus
 - c. Emerging issues
- II. Panorama of UBF use practices in urban agriculture
 - a. Individual and low-scale
 - b. Collective and large-scale
- III. Cross-sectional analysis
 - a. Specific dynamics
 - b. Joint dynamics
 - c. Future prospects



Crédits : Marco Carruzi

I. Context

- a. Why work on UBF in urban agriculture?
 - The meeting of two emerging practices
 - Short circuits, restoration of the nutrient loop, local fertilizers...
 - Mismatch of scales
- b. Corpus
 - 3 surveys with more than 50 interviews
 - International review
- c. Emerging issues
 - Panorama of practices
 - Questions from actors



Example of local loop for KOLOS project in Lyon peri-urban area

II. Panorama of UBF use practices in urban agriculture

a . Individual and low-scale

- Balcony
- Roof-top
- Private-garden
- Shared-garden



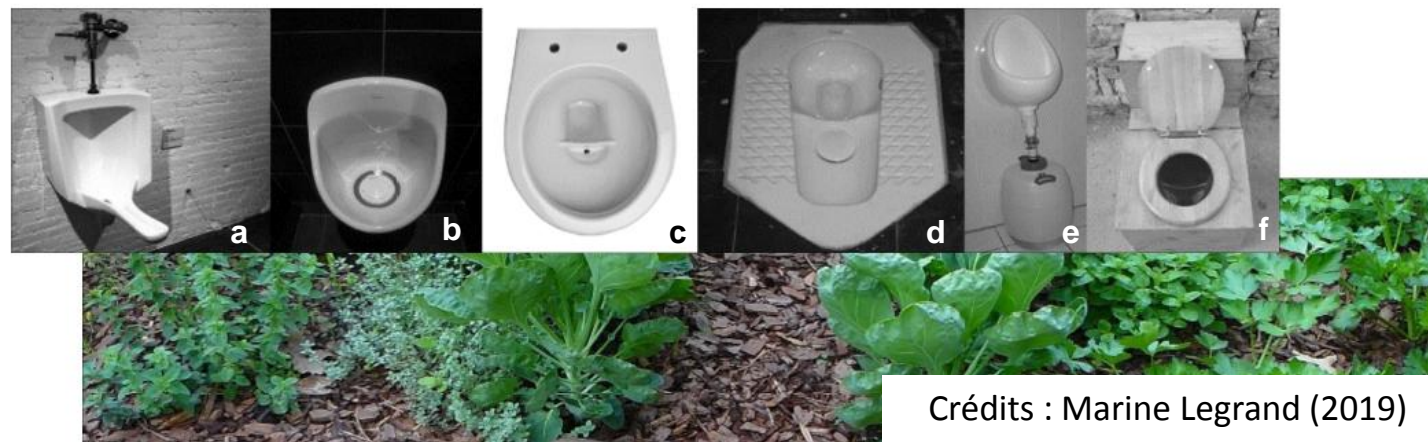
Watering can for urine fertilization in a shared garden (2022)

Crédits : Léa Weingart (2022)



Rhubarb and urine bottle on a balcony

Crédits : Bernard de Gouvello (2022)

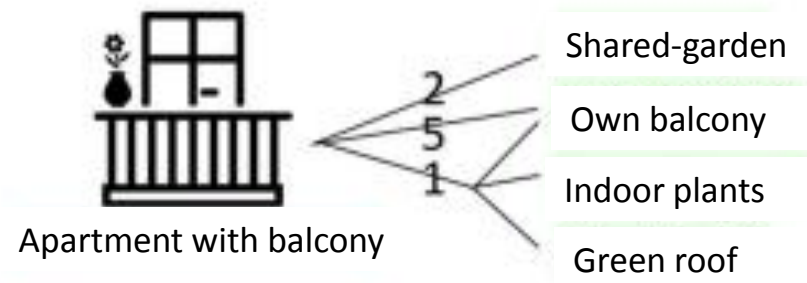
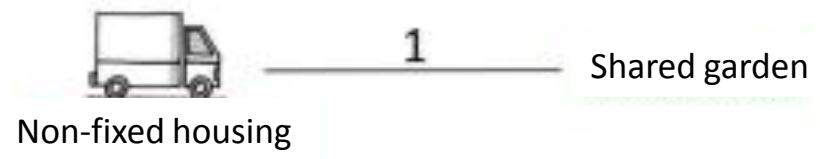
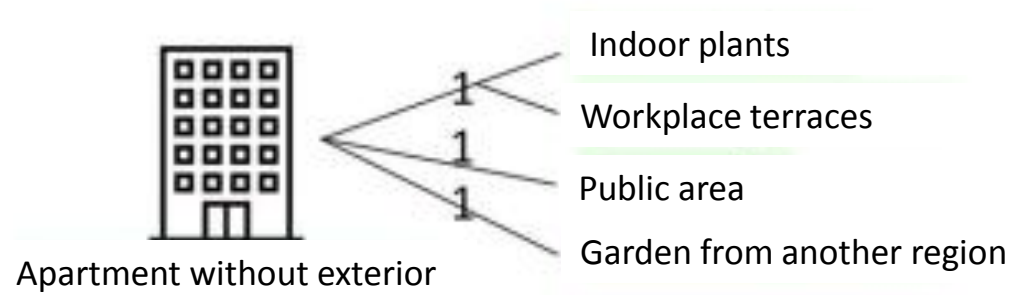
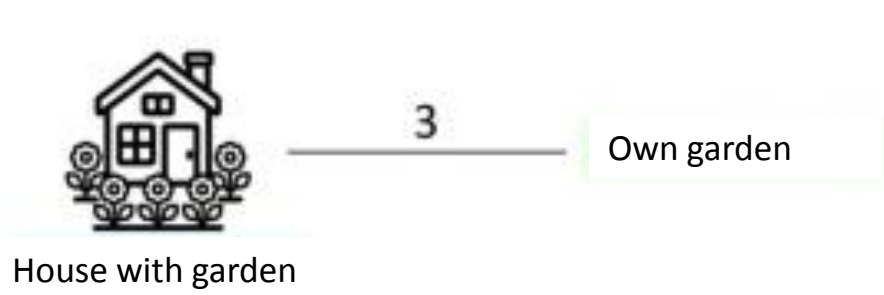


Crédits : Marine Legrand (2019)

(a), (b), (e) dry urinals - (c), (d) urine diverting flush toilets – (f) urine diverting dry toilet



Experimentation in a shared-garden (Pontanic Garden)



Légende

Housing type

Urine application site

Crédits : traduit de (Léa Weingart, 2022)

Profile of interviews for the survey of city dwellers: type of housing and places of use(2022)

Great regularity

Occasional practice

D1
Experimenting with the agronomic effects of urine

Methodical use of urine according to one's own techniques, including calculation of its agronomic effects

Use of the fertilizer value of urine trend

D2
Fertilizing and preserving water

Regularly urinating into a watering can or bottle, adding water more or less precisely according to a known dilution factor, watering your plants

D4
Freeing oneself from the toilet

For a substantial portion of the excreted urine urinate in a can or bottle, store the urine at home, then as appropriate:
(1) transport it for spreading in areas not normally cultivated
(2) dispose of it in other ways

Water resources preservation trend

D3
Preserving water by fertilizing when possible

At a random frequency, urinate in a bucket or a watering can, dilute without measuring, water the plants directly

When the opportunity arises, urinate directly at the foot of the plants rather than in the toilets

When citydwellers use urine as a fertilizer : several approaches coexist

II. Panorama of UBF use practices in urban agriculture

b. Collective and large scale

- Urban vegetable production
- Public green spaces, horticultural / landscape production : « Saint Vincent de Paul » case
- Participatory housing : « Coopérative Equilibre » case
- Peri-urban agriculture : « Saclay » case



The future neighbourhood eco-district of Saint-Vincent-de-Paul,
Paris 14th

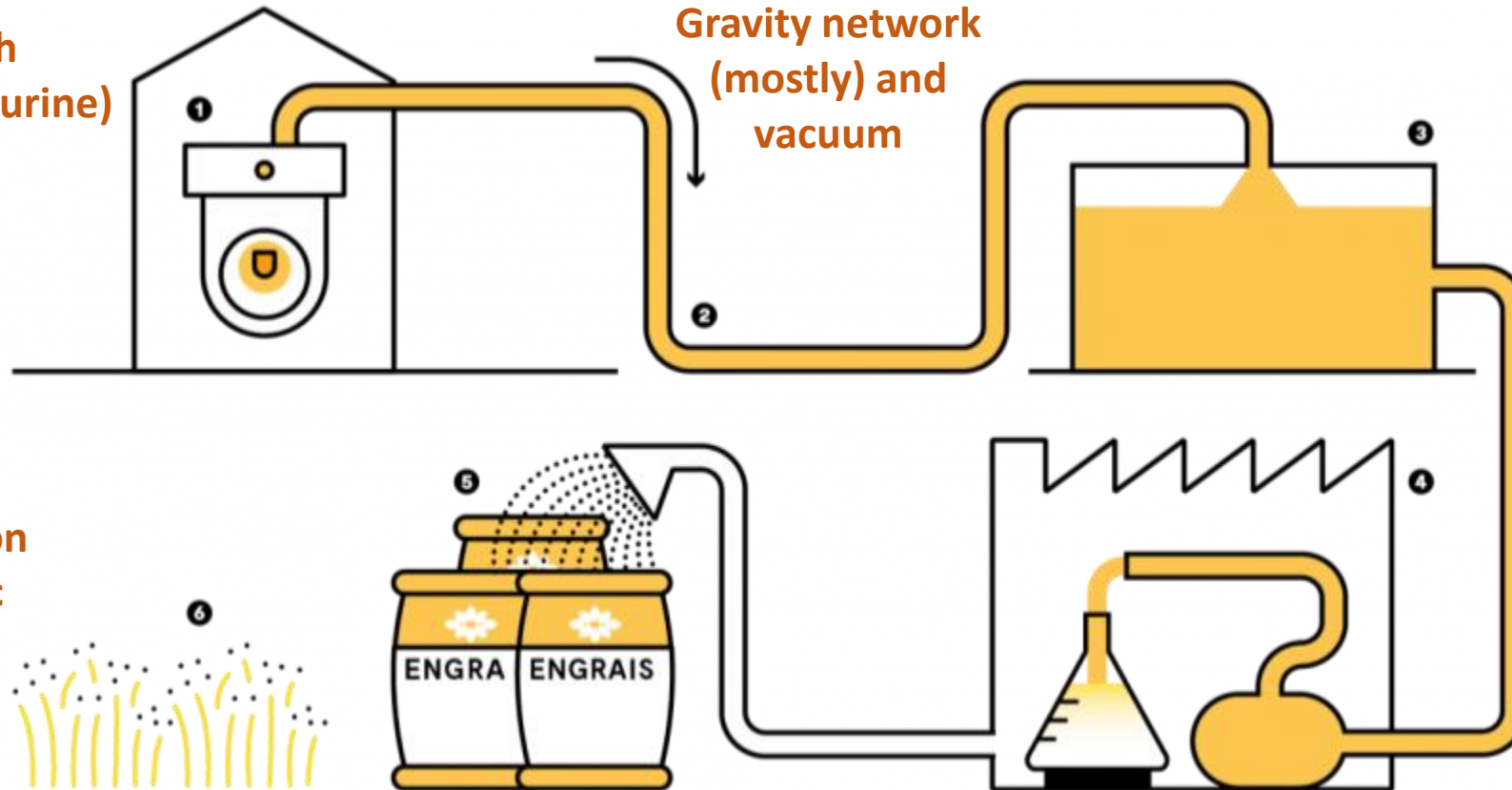
Crédits : Anyoji Beltrando - My Lucky Pixel

Separate urine collection project in the Saint-Vincent de Paul eco-district, Paris

Collection, processing and recovery techniques

1 INTERFACE

~1000 separate flush toilets (2 m³/day of urine)



2 COLLECTION

Gravity network (mostly) and vacuum

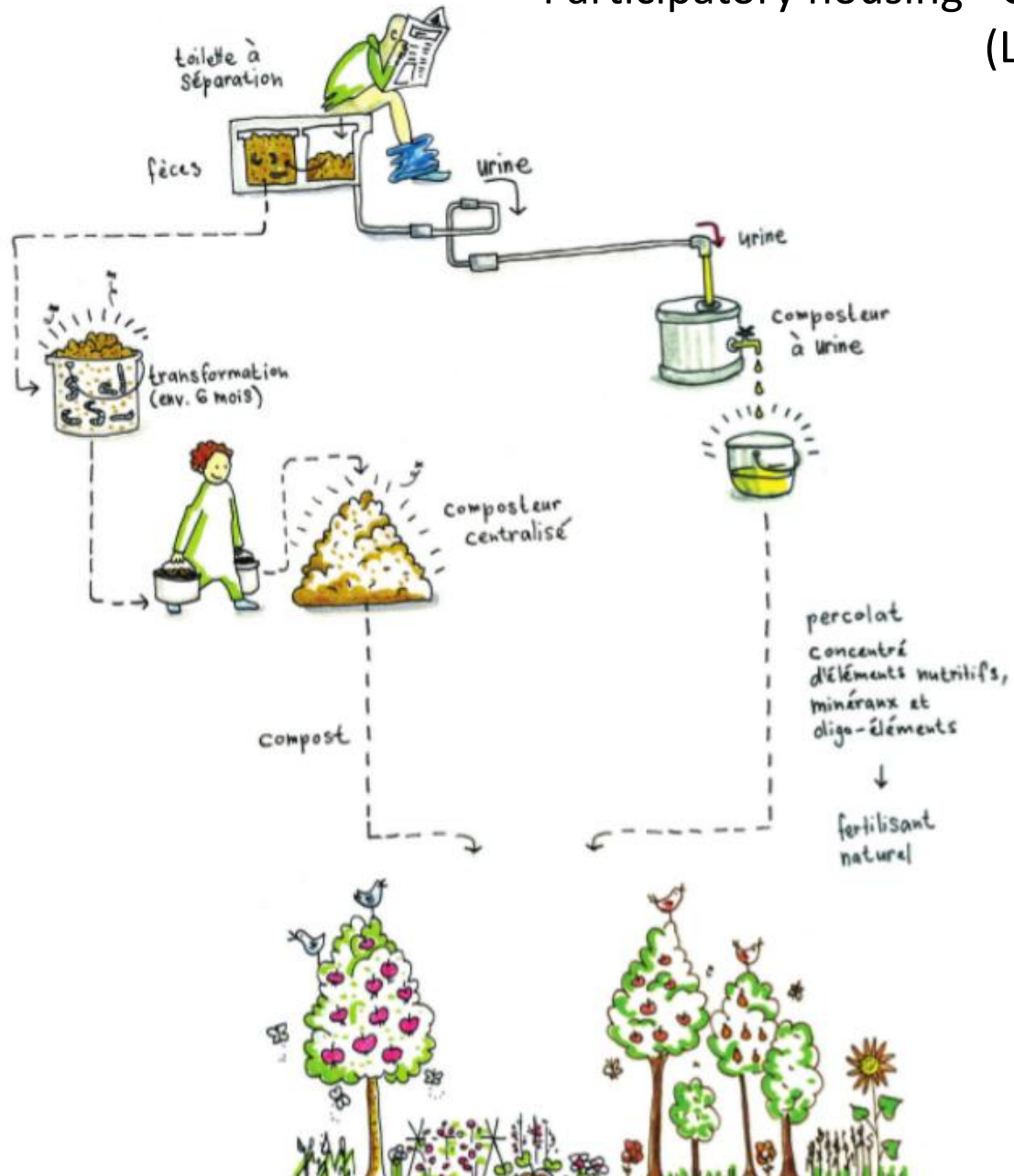
3-4-5 TREATMENT
UBF production by a process coupling N stabilisation and concentration

6 VALUATION

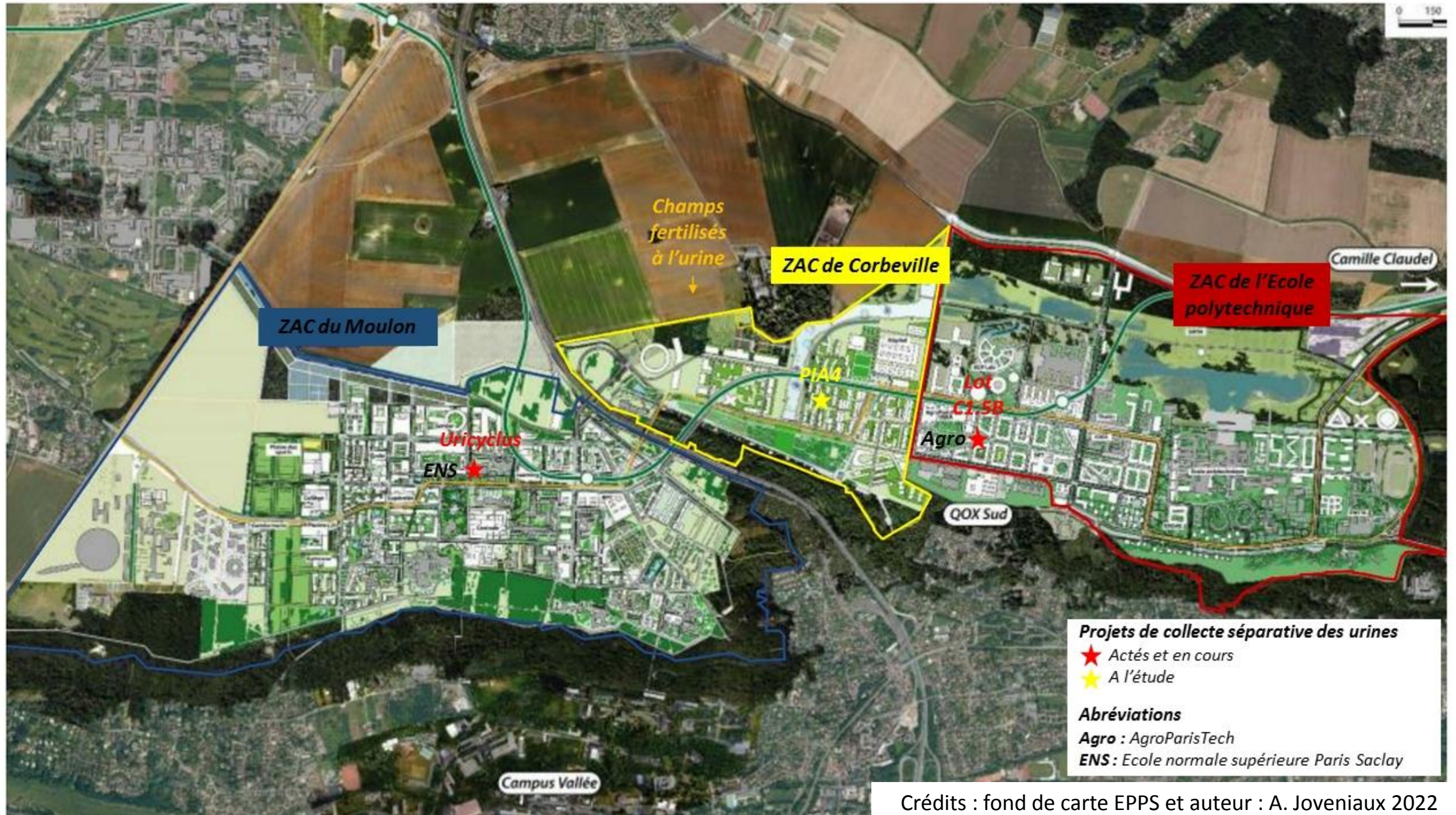
Fertilizer used on Parisian public green spaces

Crédits: <https://www.paris-metropole-amenagement.fr/fr/saint-vincent-de-paul-paris-14>^e et (Aurélien Joveniaux *et al.* 2022)

Separate urine collection and market gardening project,
Participatory housing - Cooperative Equilibre, Switzerland
(Les Vergers)



Separate collection projects in progress and under study, Plateau de Saclay





Crédits : Agrocapi

Urine sprayer in front of the AgroParisTech site, Saclay plateau,
2019 (Emmanuel Laureau operation)

III. Cross-sectional analysis

- a. Specific dynamics
 - Individual and low-scale : opportunism and pragmatism
 - Collective and large-scale : increment and complexity
 - Vs Southern countries : still presence of market gardening areas in the city (among several publications : Adeoluwa *et al.* 2010)

- b. Joint dynamics
 - Huge diversity of practices
 - Lack of knowledge relative to UBF
 - Progressive deployment
 - Complementarity between fertilizers

Valuation of human urine by a farmer



Crédits : (Florent Brun *et al.* 2020)

c. Future prospects

- Radical change in practices
- Nitrogen, phosphorus, etc. urban deposite
- What about the soil ?
- Role of the territory

Potential and limits of urban agriculture as an outlet for human urine?

OR

Urban agriculture, finally a way for the circularity of nutrients?

Human urine, part of short urban food circuits?



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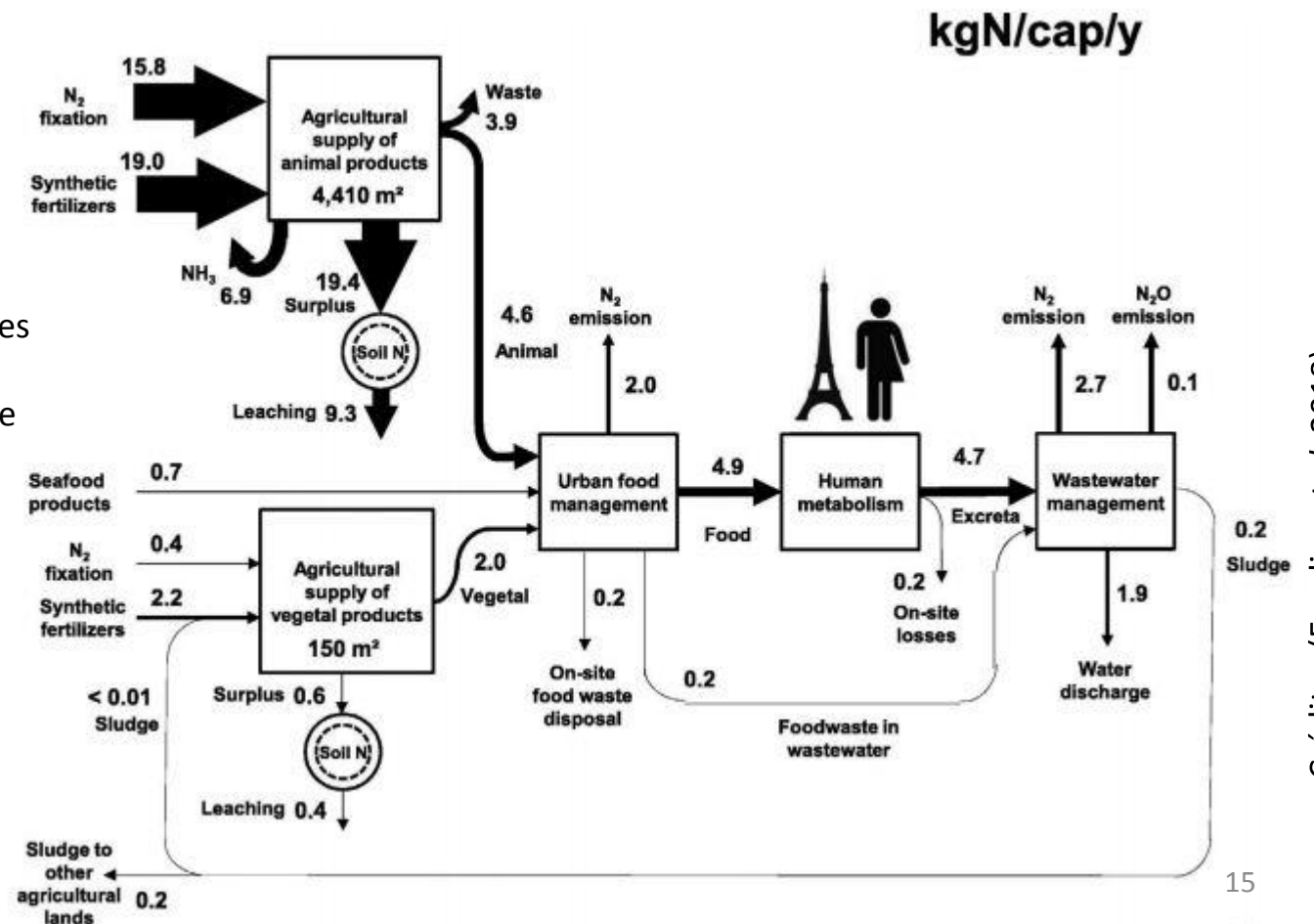
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Crédits : (Esculier et al. 2018)

Merci pour votre attention

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