

# Climate change impacts of an urban mushroom farm

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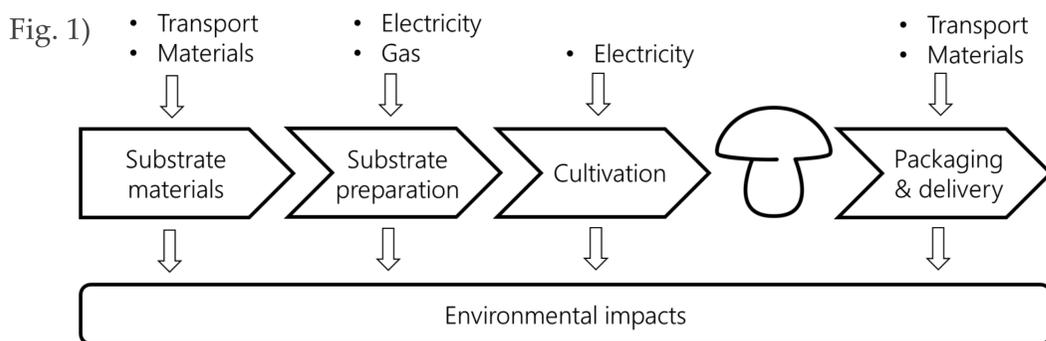
## Background

Mushroom farming is a growing form of **urban agriculture**. It fills an (urban) ecological niche, by 1) taking up and treating urban waste, 2) growing food, and 3) creating compost as a waste product. Mushrooms can grow on substrates made from a wide variety of waste products, and this upcycling avoids waste treatment (landfilling or incineration) and the related environmental impacts. Furthermore, transforming this waste into useful compost allows farmers to avoid purchasing fertilizers, peat, or other substrate amendments. This re-use of materials exemplifies urban mushroom farming's contributions to a **circular economy**, which can come with overall reduced environmental impacts. Additionally, as with all forms of urban agriculture, urban mushroom farms may have environmental advantages due to their **reduced transport** distance to suppliers and customers.

## Objectives and Methodology

To evaluate the above advantages of circular economy and short transport distances, we quantified the environmental impacts of a commercial urban mushroom farm using the method of **life cycle assessment**.

We assessed production at a mushroom farm in Paris (France) in 2018. Data was collected through interviews and farm records, and the system was modeled according to the diagram below (Figure 1). Impacts were calculated per kilogram of mushroom grown.

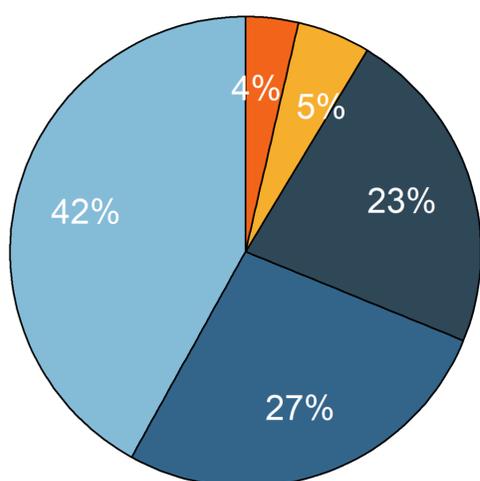


## Results, Conclusions

- The mushroom farm effectively mitigates the impact of the materials they use through circular economy and upcycling, as evidenced by the mere 5% contribution of these materials to climate change impacts (Figure 2).
- However, even though the farm has a strong focus on local supply chains, they incur large impacts from the transportation activities (22% of the total) due to frequent deliveries of products (mushrooms) and supplies (coffee grounds, wood chips...). (Figure 2).

Fig. 2) **Contribution of input types to climate change**

Gas Electricity Transport Material Other



## Key figures:

- The substrate is largely composed of used coffee grounds.  
**2.52 kg. used coffee grounds upcycled per kg. mushroom produced.**
- Waste (mushroom compost) is used by local farmers.  
**5.87 kg. compost produced per kg. mushroom produced.**
- Supplies are sourced locally, and mushrooms are delivered locally.  
**Half of the transport is done within 40 km of farm.**

- With a straightforward assessment of activities at the urban, circular mushroom farm, the baseline climate change impact is similar to that of other mushroom farms (Figure 3)
- However, if we give the mushroom farm credit for avoiding incineration of the coffee grounds they use (by simply subtracting climate change impacts of that incineration), the impacts are reduced by 62%.
- This highlights the important external services the farm provides: re-using urban waste and avoiding typical waste treatment.

Fig. 3) **Importance of avoided waste treatment**

