nature portfolio

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Reporting Summary

Nature Portfolio wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Portfolio policies, see our Editorial Policies and the Editorial Policy Checklist.

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a	Confirmed	
☐	☒	The exact sample size (*n*) for each experimental group/condition, given as a discrete number and unit of measurement
☐	☒	A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly
☐	☒	The statistical test(s) used AND whether they are one- or two-sided *Only common tests should be described solely by name; describe more complex techniques in the Methods section.*
☒	☐	A description of all covariates tested
☐	☒	A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons
☐	☒	A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals)
☐	☒	For null hypothesis testing, the test statistic (e.g. *F*, *t*, *r*) with confidence intervals, effect sizes, degrees of freedom and *P* value noted *Give P values as exact values whenever suitable.*
☒	☐	For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings
☒	☐	For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes
☒	☐	Estimates of effect sizes (e.g. Cohen's *d*, Pearson's *r*), indicating how they were calculated

Our web collection on statistics for biologists contains articles on many of the points above.

Software and code

Policy information about availability of computer code

Data collection	No softwares were used for data collection, though AirTable was used internally by the research team to record data across case studies.
Data analysis	SimaPro 9.3.0.3, EcoInvent 3, and R were used to conduct this analysis. R code was most recently tested in R 4.3.0.

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Portfolio guidelines for submitting code & software for further information.

Data

Policy information about availability of data

All manuscripts must include a data availability statement. This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our policy

All data used for this study are available in online supplementary materials. See the attached SI for more details, and see this link for access to the complete online supplementary data. Public datasets, including FPED(1), FICRCD(2), and FNDDS(3), are available for download online via their citations - included below and in manuscript. EcoInvent 3 data used for life cycle impact assessment are proprietary and may be accessed via purchase.

1. SA Bowman, Clemens, J., Friday, J. & Moshfegh, A. Food Patterns Equivalents Database 2017-2018: Methodology and User Guide. 119 http://www.ars.usda.gov/nea/bhnrc/fsrg (2020).
2. Bowman SA et al. Food Intakes Converted to Retail Commodities Databases 2003-2008: Methodology and User Guide. (2013).
3. U.S. Department of Agriculture, Agriculture Research Service. USDA Food and Nutrient Database for Dietary Studies 2017-2018. http://www.ars.usda.gov/ba/bhnrc/fsrg (2018).

Human research participants

Policy information about studies involving human research participants and Sex and Gender in Research.

Reporting on sex and gender	We do not report on sex or gender as part of this research. We do not have a sufficient sample to assess the impact of farmer/gardener sex or gender on environmental impact of urban agriculture.
Population characteristics	Population: Urban farmers and gardeners in six cities. Sampling frame: Urban farmers and gardeners affiliated with any of a number of urban agriculture organizations partnered with project team members. See below for additional details.
Recruitment	In most cases, farmers and gardeners were recruited through partner organizations in each city. For example, in several cities, informational gatherings were held with members of community garden or allotment garden collaboratives. Attendees were then invited to contact the researchers if they wished to participate. In other cases, farm or garden leaders were contacted individually or leaders of garden organizations identified appropriate participants directly. Environmental impact participants were self-selected by their willingness to participate in ongoing recording practices as part of the citizen science methods. Participants in some of the case study countries were provided nominal compensation.
Ethics oversight	Ethical review was handled by the lead institution in each country according to the rules and regulations therein (e.g., US Approval via the City University of New York, IRB File #2018-0233; German Approval via ILS – Institut für Landes- und Stadtentwicklungsforschung, May 2018).

Note that full information on the approval of the study protocol must also be provided in the manuscript.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☐ Life sciences ☒ Behavioural & social sciences ☐ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see nature.com/documents/nr-reporting-summary-flat.pdf

Behavioural & social sciences study design

All studies must disclose on these points even when the disclosure is negative.

Study description	This project sought to quantify the social and material inputs and outputs of urban farms and gardens. To trace social goods, we deployed surveys using Likert-type measures to allow participants to self-assess impacts. The survey is available in supplementary information and more detail on design is available in Kirby et al., 2021. To trace material flows, we employed "growing diaries" where participants recorded the inputs and outputs of their sites. For more details, see Caputo et al., 2020. Caputo, S., Schoen, V., Specht, K., Grard, B., Blythe, C., Cohen, N., Fox-Kämper, R., Hawes, J., Newell, J., & Poniży, L. (2020). Applying the Food-Energy-Water Nexus approach to urban agriculture: From FEW to FEWP (Food-Energy-Water-People). Urban Forestry & Urban Greening, 126934. https://doi.org/10.1016/j.ufug.2020.126934Kirby, C. K., Specht, K., Fox-Kämper, R., Hawes, J. K., Cohen, N., Caputo, S., Ilieva, R. T., Lelièvre, A., Poniży, L., Schoen, V., & Blythe, C. (2021). Differences in motivations and social impacts across urban agriculture types: Case studies in Europe and the US. Landscape and Urban Planning, 212, 104110. https://doi.org/10/gjsqbq
Research sample	72 urban farms and gardens (and associated farmers and gardeners). Relevant demographics: 53% male, 41% college-educated, 60% native born in country of survey.
Sampling strategy	Sampling was convenience. Farmers and gardeners were recruited through partner organizations in each city (see Recruitment). Environmental impact participants were self-selected by their willingness to participate in ongoing recording practices as part of the citizen science methods. Participants in some of the case study countries were provided nominal compensation.
Data collection	Material flow data (farm inputs and outputs) were collected via "diaries" provided to the farmers and gardeners which were periodically returned to researchers and recorded in an AirTable database. Surveys were conducted in-person in the local language of the site. Only the researcher and the participant were present for the survey. More information can be found in the study methods.
Timing	March 2019-November 2020
Data exclusions	Several gardens were excluded from final analysis because of incomplete data reporting or specific inconsistencies with data.

Non-participation	As overall sampling of farms and gardens was convenience, non-participation rates cannot be calculated. There was no survey non-participation among material flow participants.
Randomization	Randomization was not employed. Only descriptive analysis was reported in this manuscript.

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involved in the study
☒	☐ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology and archaeology
☒	☐ Animals and other organisms
☒	☐ Clinical data
☒	☐ Dual use research of concern

Methods

n/a	Involved in the study
☒	☐ ChIP-seq
☒	☐ Flow cytometry
☒	☐ MRI-based neuroimaging