



Climate Change and Community Growing

Social Farms & Gardens
Cymru



INTRODUCTION

Climate and growing are intrinsically linked and one of the main impacts of climate change is on our food systems. As parts of the world heat up and water becomes scarcer, we need to make our local food systems more resilient – both to mitigate the effects of climate change and make sure that people have access to healthy and affordable food. Community growing has a role to play in this.

1. THE RESEARCH

In January 2024 some research was published in Nature – the International Journal of Science which suggested that community growing might need careful planning to avoid having a larger carbon footprint than that of conventional agriculture! We've digested the information in the study to find out what why some projects were carbon intensive and to give you some tips on reducing your own projects carbon footprint.

If you'd like to read the study itself you can find it here; ['Comparing the carbon footprints of urban and conventional agriculture'](#).

The study looked at 73 urban agriculture sites – a mixture of urban farms, community gardens and individual growing plots. Of those – 17 performed as well as conventional agriculture in carbon terms – and they were mainly urban farms and individual growing plots. The sites with the highest carbon impact were community gardens.



Urban
Agriculture
3.42KG Co2 per
Kilo of produce

Conventional
Agriculture
0.47KG Co2 per
Kilo of produce

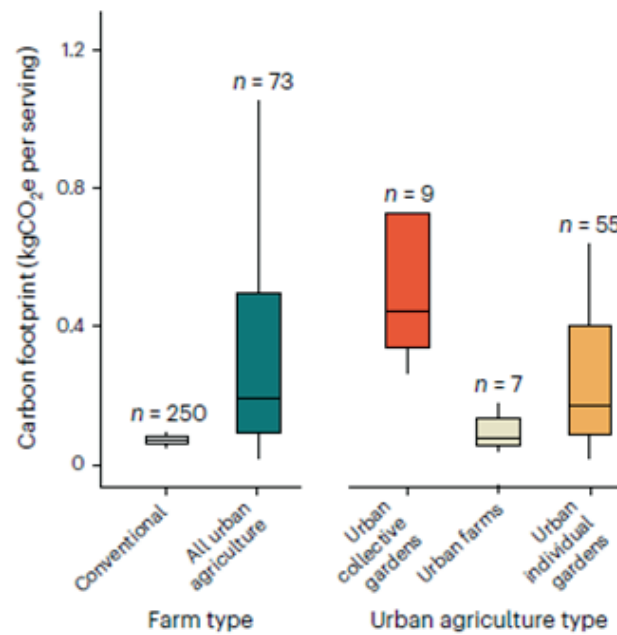


Fig. 1 | The carbon footprint of conventional versus urban agriculture. Results are shown per serving of produce as defined by the United States Department of Agriculture. Boxplots reflect the median (center bar) and interquartile range (IQR, box minima and maxima) of GHG Impact, and UA sites above 1.0 kgCO₂e per serving are removed to improve legibility (whiskers reflect standard approximations of range based on $1.5 \times \text{IQR}$; full results are provided in Supplementary Fig. 1). Two UA sites could not be classified as collective, individual or farm, so only 71 sites are included in the right panel.

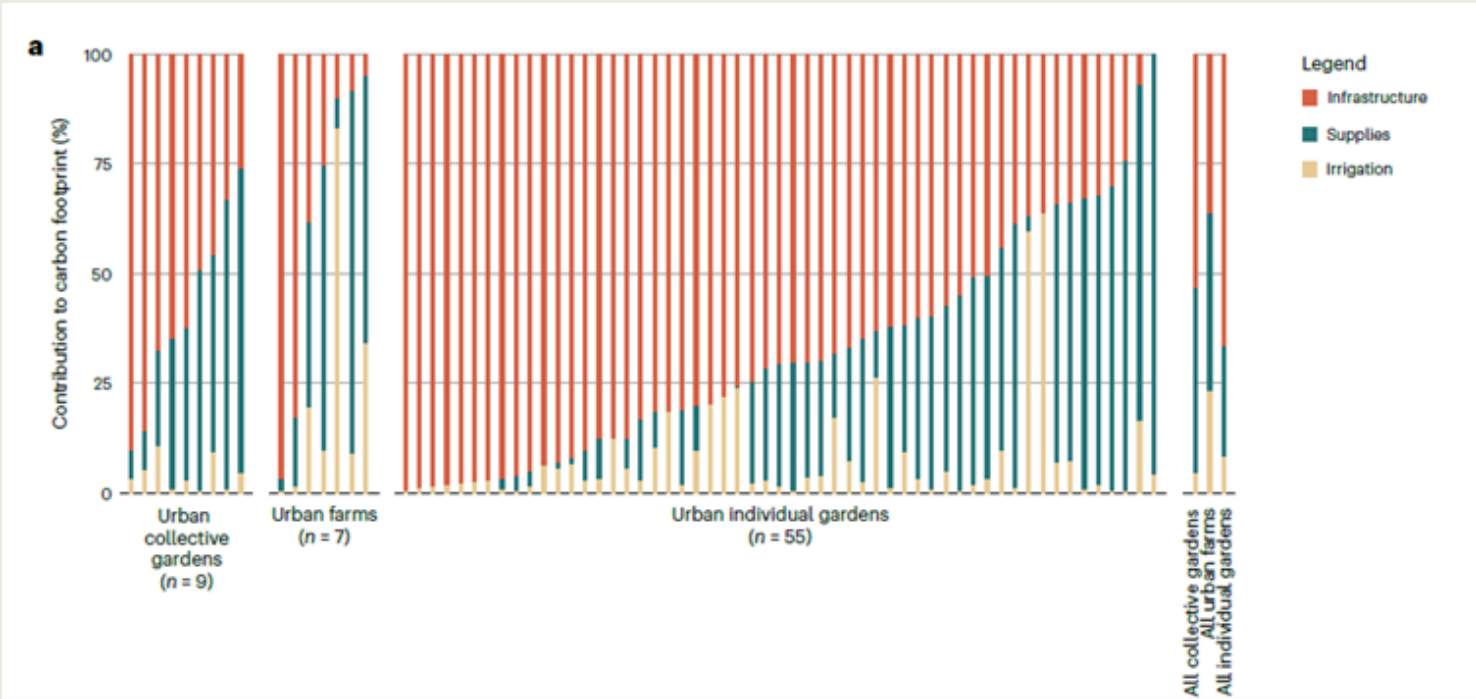
The poor performers in terms of climate impact had the following in common;

- LCA – life cycle analysis of infrastructure – lots of new materials used for a relatively short time
- Short term nature of some projects
- Low productivity
- Poor composting or high inputs

The good performers in terms of climate impact had the following in common;

- Long term projects
- High productivity
- Recycled infrastructure or longevity of new materials
- Good composting and low inputs

This revealing image shows the relative carbon impacts of different projects in terms of infrastructure, irrigation and inputs



You can see in this image the effects of infrastructure on your climate impact – how long it takes to ‘break even’.

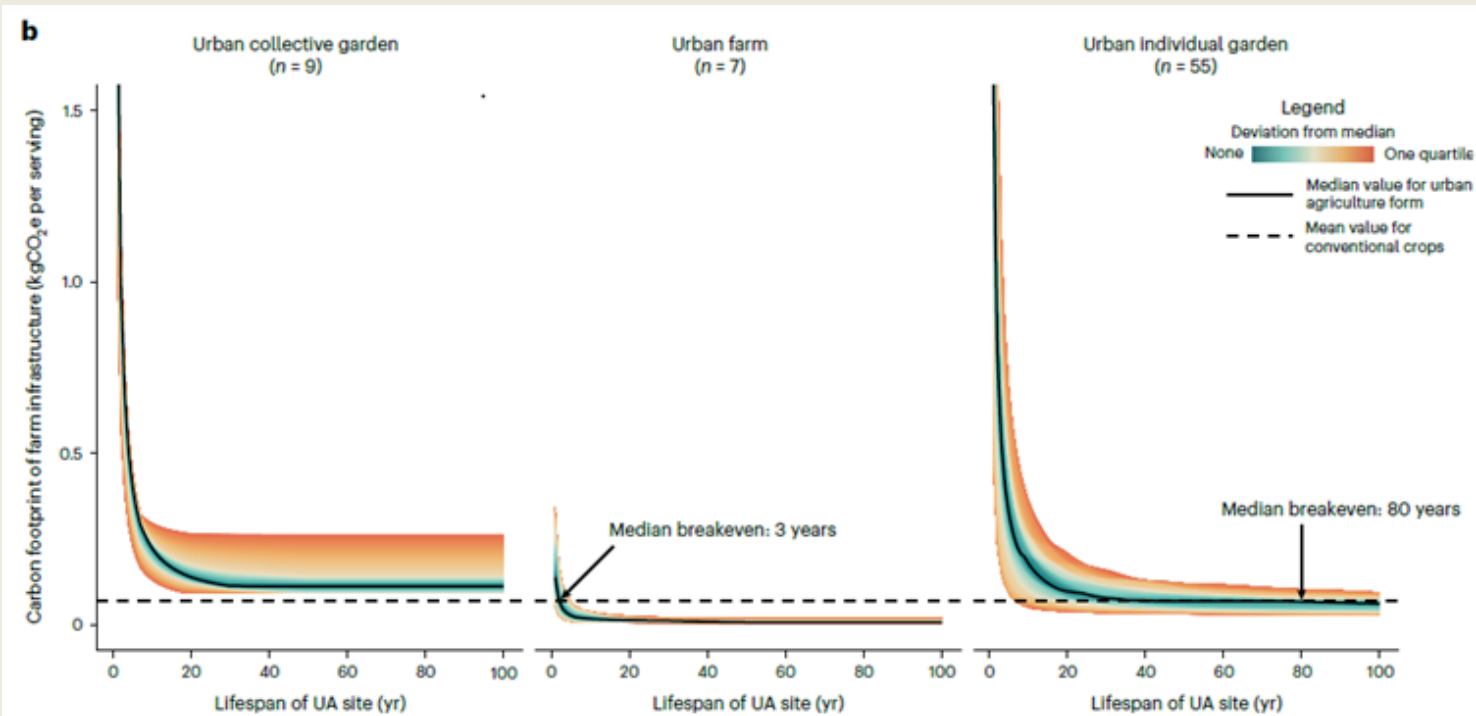


Fig. 3 | Infrastructure and carbon footprints at urban agriculture sites.
a, Contributions of Infrastructure, supplies and Irrigation to GHG Impacts. Supplies Include fertilizer, compost, gasoline, weed block textile and so on. Irrigation is blue water used on food crops. Each column is an individual urban farm or garden. b, The black lines show the median Infrastructure GHG Impacts per serving of food produced at three types of UA space as a function of farm lifetime. The dashed lines show GHG Impacts per serving using conventional agriculture. Urban farms amortize Infrastructure Investments after only three years. Individual gardens take decades, and collective gardens never break even.

2. WHY WE SHOULDN'T PANIC!

- When the studies authors adjusted for social outputs all the projects compared favourably with conventional agriculture. If 90% of your outputs are health, well being and community resilience - these outputs should also be considered when calculating your carbon impact of the relatively small amount of veg you are growing!
- When the authors adjusted for good composting and recycled infrastructure carbon footprint could be reduced by 39.4% and 52% respectively!
- **We can reduce the carbon impact of our projects enormously by making three changes; infrastructure, composting and water harvesting**
- Veg grown any way you like still has a minute carbon footprint compared to meat and dairy so if you're encouraging a veg-rich diet you're still making a difference.

The study's authors released a Policy Brief which explains how local authorities can support climate friendly community growing – which you can find [here](#). Two of their main recommendations are to ensure long term sustainability of sites but also to take into account that food may not be the main outputs of some growing projects. When you adjust for social and health benefits the carbon impact is drastically reduced.

Recommendations for Policy and Practice

Our study suggests that urban agriculture has the lowest carbon footprint when it takes advantage of urban waste streams, uses its infrastructure for long periods of time, and supports a wide array of social benefits. We identified five strategies to ensure that urban farms and gardens out-perform the impacts of conventional agriculture:

- **Allow access to safe building waste for garden construction.** Infrastructure, like raised beds, pathways, and sheds, was the largest contributor to carbon footprint on sites. Cities can facilitate a second life for materials that are otherwise headed for landfills, like scrap wood.
- **Promote low-carbon nutrient sources via composting.** By reducing food waste to landfills and reducing demand for potting soil and synthetic fertilizers, compost offers many climate benefits. But it must be managed well to reduce methane emissions, something local governments can accomplish by investing in the capacity, supplies and training needed to expand effective composting operations across the city.
- **Promote social benefits at farms and gardens.** Urban farms and gardens don't just produce food, and carbon footprinting must account for this. By expanding programs that support the social goods produced on-site, cities can reduce the carbon impact of urban food production.
- **Secure land tenure for urban agriculture sites.** Long-lived sites have lower carbon impact, and sites embedded in cities for longer have greater social footprints. Urban policies that secure land tenure for urban farms and gardens are not just a community good, they're a climate solution.
- **Identify high-carbon food imports and replace them with local production.** Findings show that not all conventionally farmed vegetables are low-carbon. In northern climes, vegetables are often grown in greenhouses or imported via air freight to avoid spoilage. By helping urban food growers make informed decisions about which crops are best to replace, cities may reduce the overall carbon footprint of their food supply. Furthermore, cities may be able to replace their own high-carbon vegetable supplies with urban sources by launching strategic local food procurement policies.

So having digested all this we can see that community growing is not a climate villain! However – the study was very useful in identifying where we can change things to reduce our carbon footprint – which is something we should all be aiming for. We only have one planet!

3. CARBON SWAPS



Raised beds made with new wood

- Reused wood from construction or demolition – scaffold planks, bricks
- Waste wood from a sawmill left over from planking
- Grave beds – only use raised beds where really needed
- If you need raised beds and don't have any recycled/reused options available then use something with a long life to reduce the impact – Life Cycle Analysis

Path surfacing

- Do you need accessible paths for wheelchair users and pushchairs?
- Instead of laying concrete - which has the highest carbon impact of any building material, use recycled sub-base – crushed concrete and brick from demolition
- For paths between beds use woodchip from tree surgeons which will feed the soil organisms. Avoid plastic which will release micro plastics over time.

Other infrastructure

- Scour free ads for old sheds, greenhouses, tools etc
- Reuse IBCs and other plastic containers from food transport for your water collection
- Make your compost heaps from pallets
- Use Bentyg (library of things) to borrow large tools or share with other plot holders
- Urban farms can set up machinery rings



Compost

- Compost is one of the largest sources of carbon emissions in the study. Bringing in compost of unknown provenance has high emissions associated with sourcing and processing – and if it contains peat it contributes to the drying of peat bogs which are enormous carbon sinks.
- If you compost on site, do it well -anaerobic composting releases methane which is a greenhouse gas 28 times as potent as CO₂, so make sure your compost pile isn't too wet.
- Carbon and nitrogen balance is also key in reducing emissions – try and add a lot of high carbon materials – you want your ratio to be at least 30:1 C:N.

Materials High in Carbon	C:N
Autumn Leaves	30-80:1
Wood Chips / Sawdust	40-100:1
Bark	100-500:1
Mixed Paper	100-130:1
Newspaper or Corrugated Cardboard	560:1
Materials High in Nitrogen	C:N
Vegetable Scraps	15-20:1
Coffee Grounds	20:1
Grass Clippings	15-25:1
Manure	5-25:1

- Currently we don't value and use nutrients effectively in conventional agriculture – relying instead on artificial fertilisers. Nutrients are wasted or over applied and cause pollution – methane and N2O emissions and run off into our rivers. Using these sources of nutrients responsibly is a clear benefit.
- Local Authority green waste compost can be used as a soil improver/mulch or further composted.
- Vermicomposting your kitchen waste or manure is highly effective and releases less emissions than traditional composting.
- Seed compost can be made with a mixture of leaf mould or coir and sieved compost.
- Try using 'chop and drop' to feed your soil instead of carting weeds to the compost heap.

Water harvesting

- Collect water from sheds and greenhouses
- Connect IBCs and use ballcocks
- Use water troughs to encourage use of watering cans over hoses
- Mulch mulch mulch! Bare soil loses moisture

Choose your crops carefully

- Grow crops that are often air-freighted to retain their freshness such as French beans, sugar snap peas or asparagus.
- Growing crops that require a lot of packaging and refrigeration such as soft fruit is a climate win.



It's not all about carbon!

- Community growing sites are biodiversity havens – incorporate nature friendly habitats like ponds and margins and look after your soil
- Community resilience and empowerment are essential in adapting to the climate crisis
- Behaviour change extends to whole lifestyle – for example eating seasonally, eating more veg
- Good quality fresh food is often not available or increasingly unaffordable
- Packaging waste and transport particulates are not associated with community grown food
- 30% of food produced is wasted - are the figures less for community grown food?
- Mental and physical health benefits are well documented - maybe a study to compare the carbon footprint of different health interventions and hobbies would be interesting?

Tracking your carbon footprint

You can keep track of your project's carbon footprint by looking at your inputs, transport and infrastructure spending and having a conversation each year about how they can be reduced. At every opportunity think about sourcing used items instead of new, or using locally produced sustainable materials. Just having a regular conversation about this can encourage your volunteers to consider similar measures they can take in their own lives. Climate change is happening – but we can reduce the impact by the combination of our thousands of small actions.



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Social Farms & Gardens - UK wide charity supporting communities to farm, garden and grow together.