
**The Urban Energy/Food Nexus: Peri-urban agriculture & sustainable cities**

Peri Urban Agriculture and Renewable Energy

Metropolis | Cities in Transformation - Porto Alegre, Brazil

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## Outline:

1. Overarching challenge.
2. Ecological footprint – Cape Town.
3. Status of fresh produce in Cape Town.
4. Cape Town case for peri urban agriculture.

# Overarching Challenge

- Globally urban areas are experiencing a convergence of mutually reinforcing sustainability crises – the polycrisis.
- The energy/food nexus is a core component of these crises.
- Addressing these two dominant, but mutually reinforcing, urban challenges requires fundamentally different urban governance strategies.
- Globalised food distribution approaches are the norm in South African cities.
- Cape Town's location amplifies these challenges.

# City of Cape Town …

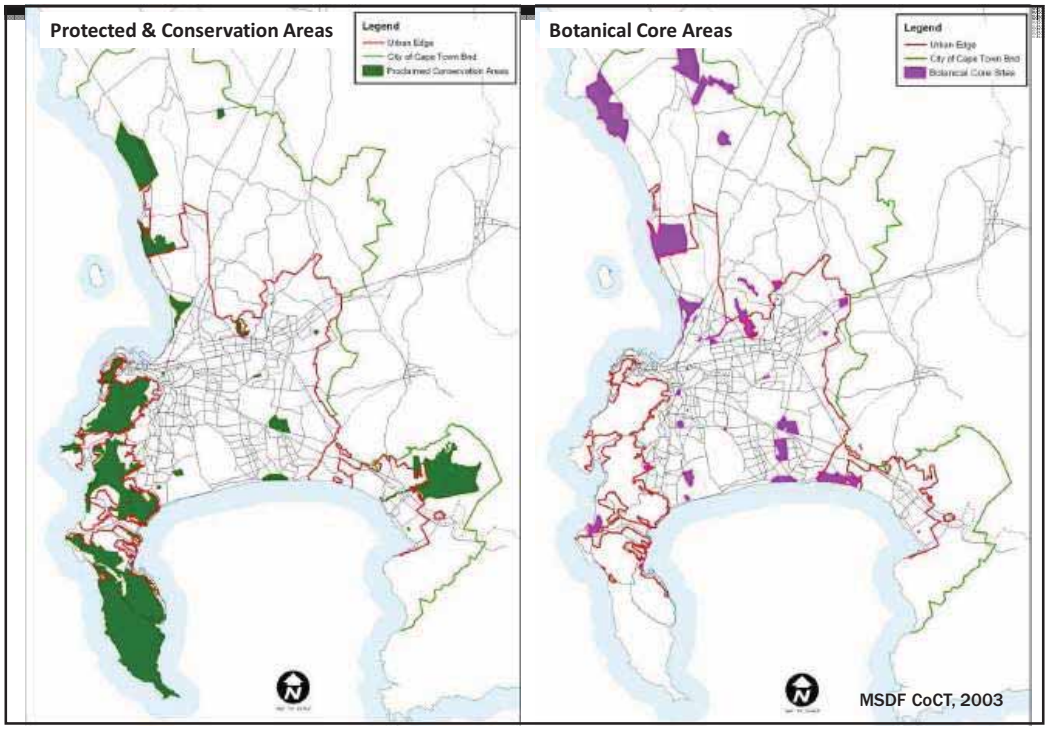
## Cape Town's EF (Summary)

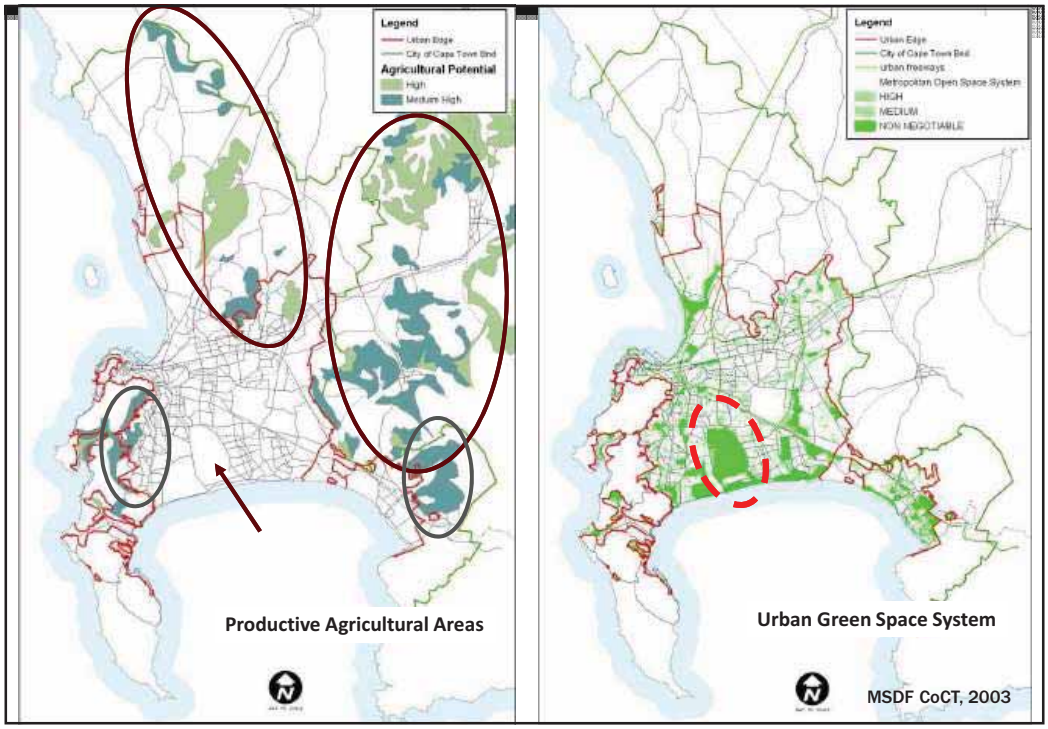
| | Crop | Pasture | Sea | Forest | Built | Energy | Total EF | Biocapacity |
|---|---|---|---|---|---|---|---|---|
| EF South Africa 2006 (2003 data) (pop: 45 Million) | 0.38 | 0.23 | 0.05 | 0.17 | 0.05 | 1.35 | 2.30 | 2.0 |
| **EF Cape Town 2006** | **0.73** | **0.44** | **0.10** | **0.32** | **0.10** | **1.35** | **3.04** | |
| | **24%** | **14%** | **3%** | **11%** | **3%** | **44%** | | |

**Ecological Deficit (3.0 – 2.0 = 1.0)**
**Big contributors**
- **Energy 44%**
- **Food 41%**

**(fresh produce about 11% of total food EF)**

Source: Gasson, 2002 & Hansen, 2009


Protected & Conservation Areas
Legend
Urban Edge
City of Cape Town Bnd
Proclaimed Conservation Areas
Botanical Core Areas
Legend
Urban Edge
City of Cape Town Bnd
Botanical Core Sites
MSDF CoCT, 2003


Legend
Urban Edge
City of Cape Town Bnd
Agricultural Potential
High
Medium High
Productive Agricultural Areas
Legend
Urban Edge
City of Cape Town Bnd
urban freeways
Metropolitan Open Space System
HIGH
MEDIUM
NON NEGOTIABLE
Urban Green Space System
MSDF CoCT, 2003

# Fresh Produce Status in Cape Town

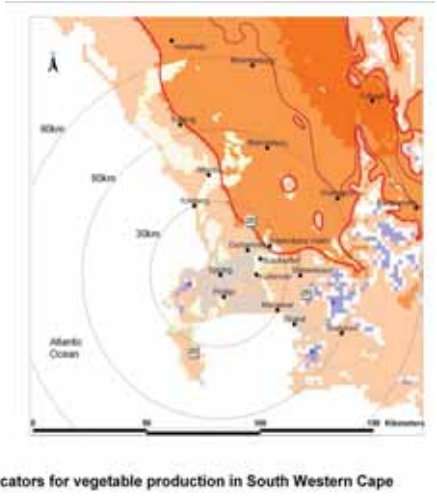
- Supermarkets account for an estimated 70% of all fresh produce sales.
- 4 main supermarkets sell over 320 000 tonnes annually in the City (excl grains).
- Of this produce, the main 29 items account for 95% of all fresh produce.
- Of these 29 items, 16 items are suitable for growing in region (74% of total consumed).
- Considering a variety of challenges – unemployment, food insecurity, distance to other production zones, etc. – peri urban agriculture is a key opportunity.
- Recognised by CT being the only city in SA (1 of 3 in SADC region) to have a formal UA policy.

| Fresh Produce Items Required | Tonnes consumed annually in Cape Town | Cape Town land required for 100% production | Cape Town land required for 10% production |
|---|---|---|---|
| X 29 Items | 305 493 t | 13 137.7 ha | 1 300.00 ha |

- Opportunity is not attracting the necessary attention, why?

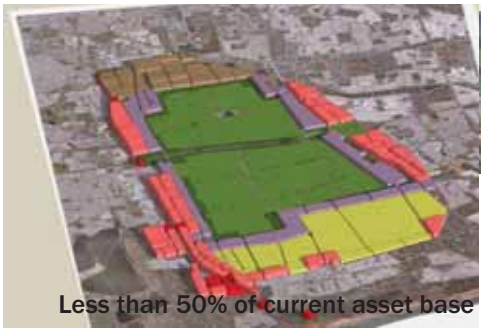
# Climatic & geography add further importance

- Limited productive area defined by climate and geography.
- Closest alternative is agrizone 500km away and then most other areas over 800km.
- A vulnerability not recognised within the current supply system.
- Context does matter and each city will have a different set of dynamics – Cape Town can't be viewed in the same way as other cities ...



Climate indicators for vegetable production in South Western Cape

# Overarching Challenge - the PHA Case



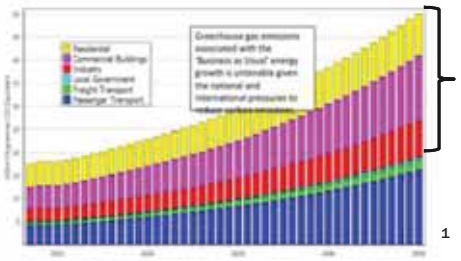
Less than 50% of current asset base

1. Cape Town has valuable peri urban assets, such as the Philippi Horticultural Area – 1000 ha of arable and irrigated land, but ...
2. These are contested due to other development and arguably political needs – Housing in particular.
3. Debate thus reverts to assessing economic viability and not broader sustainability challenges?

PHA Pepco Housing Com, 2009

# Cape Town Energy Challenge

70% of total emissions



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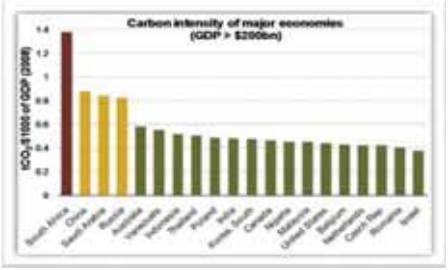



3

| | Carbon Productivity | Per capita Production Carbon Footprint |
|---|---|---|
| | [USD GDP / tonne $CO_2e$] | tonnes $CO_2e$ / capita / annum |
| City of Cape Town | 670 | 7.8 |
| Western Cape | 770 | 6.1 |
| South Africa | 400 | 8.9 |
| Required by 2050 for stabilisation at 450ppm | **7,300** | **1.2** |

2

- The Western Cape is tied into a dirty and inefficient energy supply structure that positions SA as the **12th largest emitter globally** .
- South Africa, and the Western Cape in particular, can **no longer apply the development or economic strategies of the past** in planning interventions to address our development challenge.

1. Sustainable Energy Africa,2007
2. From McKinsey , 2010 & PGWC, 2011
3. Cloete, B. DNA Economics, 2009

## The Cape Town food & energy system

- The Cape Town food and energy system is not designed to meet the needs of most of its citizens.
- While the costs of the input/output model can be carried by the wealthy, it imposes harsh challenges on a significant number of its citizens.
- The current food and energy system is also unsustainable and benefits today are "borrowing endowments" from both the poor and future generations.
- Structures are in place to support necessary transition but cannot move to respond to the real needs of the citizenry.
- Administrative silos, legislation and *aspiration* of western urban development models are a key impediments.

## Peri Urban Agriculture – A critical urban function.

- Current writings often reflect the Peri Urban Interface negatively –

*Peri-urban interfaces-the zones where urban and rural areas meet-suffer from the greatest problems to humans caused by rapid urbanization, including intense pressures on resources, slum formation, lack of adequate services such as water and sanitation ...*

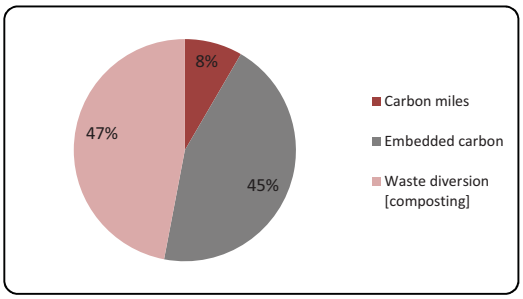
- McGregor, Simon & Thompson, 2006

- Positive perspectives re-emerging on the role that PUI can play as a core asset in closing the open metabolic flows that define most cities today.
- The relationship between energy, food and the PUI allows for the realisation of a wide variety of positive impacts, both direct and indirect (secondary).
- Peri urban areas can also be areas of clean energy generation through biodigestion and animal husbandry.

| The following direct and secondary impacts have been identified through the PGWC assessment: CoCT, 2010 | |
|---|---|
| Natural resource socio-economic impact | Bio-climate tourism |
| Water urban development | Alien invasive control |
| Industrial activities | Biodiversity nature-based tourism |
| Population size | Nature-based agriculture |
| Health | Subsistence livelihoods |
| Agro-climate crop choice | Ecosystem processes - fire frequency, alien invasion etc. |
| Product quantity and quality | Disaster management |

# Cape Town case for peri urban agriculture

- A recent into the relationship between food and energy (and subsequent emissions) reflects a need for a fundamental review of the food system:
  - Changes in the approach to fresh produce acquisition and production will have a significant impact on the total city's emissions of 20 million tonnes.
  - The Cape Town data shows that if just 10% of food is grown locally – more than achievable with local peri urban land, far higher emission reductions than originally assumed can be achieved.
  - Viewing peri urban areas as facilities to assist in closing metabolic flows offers even greater benefits. This then supports further efforts to reduce the energy intensity of production by supporting LEI agricultural methods through a transition to organic inputs.




Savings in Carbon Emissions - 10% diversion to PUA (of fresh produce contribution)

- Further benefits include:
  - Estimated 5100 new jobs
  - Stimulation of new urban economies
  - Cost reductions of as much as 25%
  - Compostable organic waste is 40 -60% of CoCT waste stream.
- Livestock keeping often seen as negative but managment approaches are key – can add to city significantly – at numerous scales.

# Livestock in the cities or PUI?

- Animal products account for 88% of CoCT food component of ecological footprint - thus requires pragmatic intervention.
- While frowned upon by most urban policy makers, this is an real activity in emerging African cities.
- While small livestock can be part of urban strategies, PUI can unlock far greater value.
- Currently CoCT officials respond through policies baring livestock for most areas – result conflict and waste of resources .
- Livestock's greatest challenge is also greatest opportunity – biodigestion for energy –
- Most city technicians understand this as takes place at waste plants.

## In conclusion

- Peri urban agriculture allows for the integration of a number of urban development challenges.
- The dual lenses of food and energy are key in the recognition of the broader sustainability challenges of the urban form, particularly into the future – loci of critical fault lines.
- For most cities, but for developing cities particularly, peri urban areas are under extreme threat to other (often more immediately "evident") development imperatives.
- Small scale livelihood land use options add some value but larger more integrated areas, such as peri urban areas, offer far greater benefits –through economies of scale but also socially and ecologically.
- The energy food nexus is key to a sustainable city and peri urban agriculture adds real value to the PUI.

thank you | www.africancentreforcities.net
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