

Supermarkets, Smallholders and Standards Project: Determining Natural Resource Impacts of African Horticultural Exports

The Climate Impact of Air-freighted
Fresh Fruit and Vegetable Imports

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Zoe Wangler
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The Climate Impact of Air-freighted Fresh Fruit and Vegetable Imports

Slide 1: Presentation Contents

- A. What are the environmental critiques of air-freighting agricultural produce?**
- B. Findings from LCAs of food products**
- C. Can we calculate the climate impacts from the production and transportation of agricultural produce from Africa? Can we compare these impacts with other produce and other activities?**

What are the environmental critiques of air-freighting agricultural produce?

Slide 2: Emissions from Aviation

- “More than any other industry sector, aviation emissions threaten the integrity of the world stabilising carbon emissions at a level that avoids dangerous climate change.” Anderson et al. (2006)
- Aviation found responsible for 3.5% global warming in 1990s – IPCC (1999)
- Aircraft emissions have grown rapidly:
 - While total GHG emissions reported by Annex 1 Parties to the UNFCCC decreased from 1990 – 2000, international aviation emissions were singled out in reports for their increase of 48% – UNFCCC (2003)
- Aviation is still one of the fastest growing sectors of the UK economy
- Growth for freight is projected to be greater than for passenger aircraft. According to the DfT, air-freight doubled in the two decades between 1969 and 1989 and doubled again in the decade to 1999. DfT projects more than doubling of 1999 rates by 2009 – DfT (2003a).

What are the environmental critiques of air-freighting agricultural produce? Slide 3: 'Air-freighted Produce is Energy Inefficient'

- 'for every calorie of iceberg lettuce, flown from Los Angeles, we use 127 calories of fuel' (Sustain 2001)
- A Californian head of lettuce air-freighted to the UK produces five times its weight in CO₂ (Millstone and Lang 2003)
- Air-freighted food represents less than 1% of food vehicle-kilometres but 10% of CO₂ emissions associated with food transport (DEFRA 2005)

What are the environmental critiques of air-freighting agricultural produce?

Slide 4: Emissions Allocated to UK International Aviation

1990		
IEA 1990	UNFCCC 1990 (3b)	FAST 1990 (3a)
12.98Mt	14.79Mt	11.48Mt

2000		
IEA 2000	UNFCCC 2000 (3b)	FAST 2000 (3a)
23.83Mt	29.41Mt	20.15Mt
84%	99%	76%

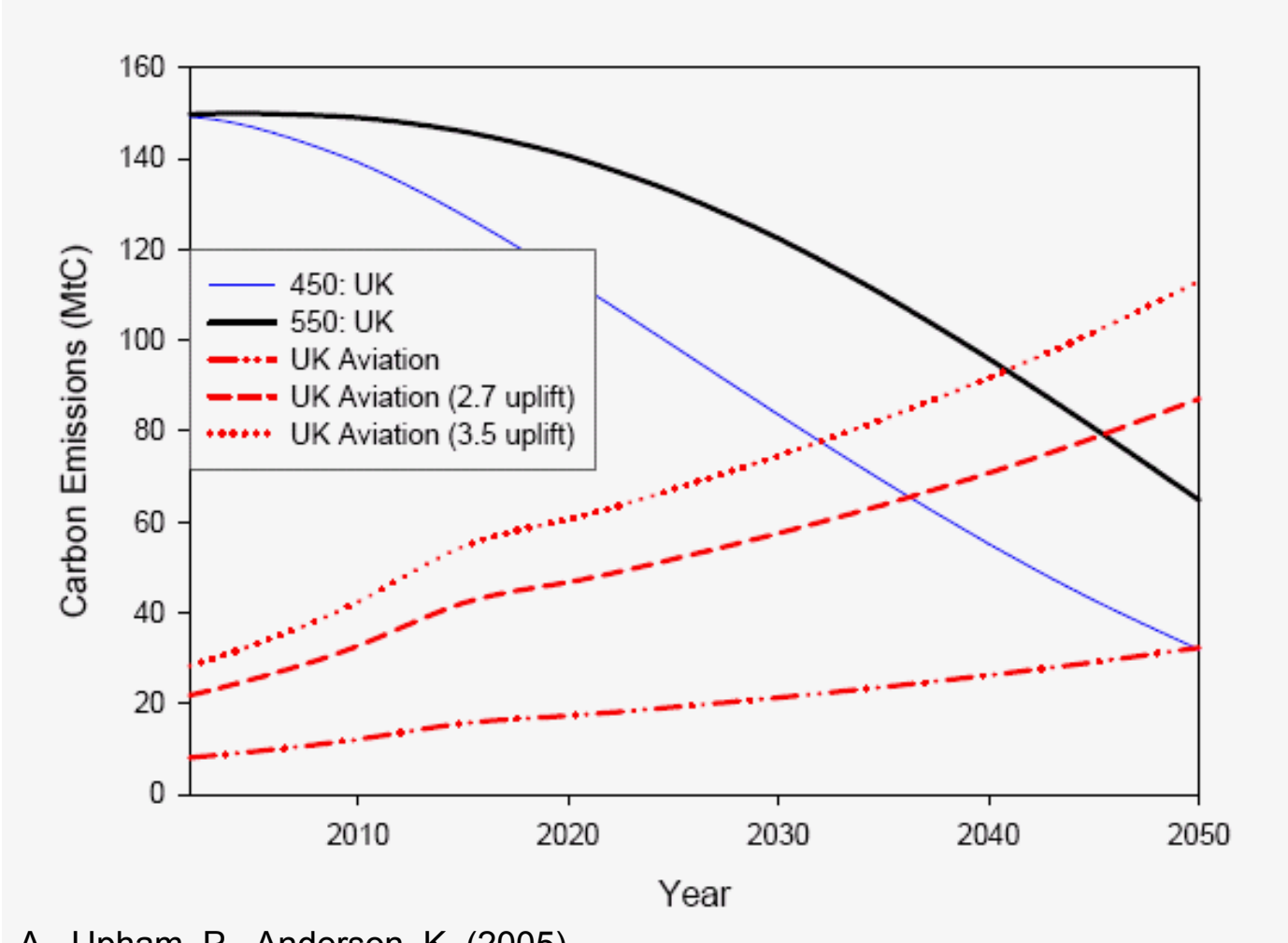
Percent Increase
1990 -2000

Total UK annual CO2 emissions*: 606.47Mt CO2		
% International Aviation represented:		
2%	2%	2%

Total UK annual CO2 emissions*: 560.27Mt CO2		
% International Aviation represented:		
4%	5%	3%

What are the environmental critiques of air-freighting agricultural produce?

Slide 5: UK Emissions Forecast and Kyoto Targets



Source: Bows, A., Upham, P., Anderson, K. (2005).

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Slide 6: C, CO2 and CO2e

- Aviation emissions are discussed in terms of tonnes of carbon, carbon equivalent, carbon dioxide and carbon dioxide equivalent
- Carbon dioxide can be calculated by multiplying carbon emissions by 44/12
- Some calculations apply the Radiative Forcing Index (RFI). This is the ratio of total radiative forcing to that from CO2 emissions alone. CO2 only represents about a third (37%) of the global warming potential of aircraft emissions. The other mechanisms are:

Mechanism	Contribution to GW
NOx (via ozone changes)	47%
NOx (via methane changes)	-29% (-ve represents cooling effect)
Contrails	41%
Stratospheric H2O	4%
Sulfate aerosol	-6%
Soot	6%

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Slide 7: Contrails (day vs. night flights)

Researchers at Reading University found:

- Contrails have two opposing influences on climate: trapping heat and reflecting sunlight
- Night flights do not reflect sunlight
- Night flights monitored at the entrance to the N Atlantic flight corridor make up 25% of air traffic but contributed 60-80% contrail radiative forcing
- Winter flights, 22% of total, contributed 50% contrail radiative forcing

What are the environmental critiques of air-freighting agricultural produce?

Slide 8: Allocations to Freight and Passenger

		Emissions of CO2 - 2000			
		IEA 2000	UNFCCC 2000 (3b)	FAST 2000 (3a)	DfT 2000
By sector		23.83Mt	29.41Mt	20.15Mt	27.81Mt
Passenger (intl)	85%				23.68Mt
Passenger (domestic)	5%				1.40Mt
Freight (international)	5%				1.36Mt
<i>Of which FFVs (1998)</i>	<i>13%</i>				
Freight (domestic)	0%				0.09Mt
Surface access	5%				1.28Mt

- In 1998, within international freight, a third of all freight was lifted in cargo only aircraft, and the remainder travelled in the belly-hold of passenger aircraft
- Between 1992-1998, freight travelling in cargo only aircraft grew annually by 11.62% while freight in belly-holds grew by 8.15% (DfT 2001)

What are the environmental critiques of air-freighting agricultural produce?

Slide 9: Past and Projected Freight Growth

- According to the CAA, between 1992-1998 tonnes of air-freight almost doubled, averaging a 9.13% annual increase (DfT 2001)
- Non-EU air-freighted FFV imports showed a 6% upward year-on-year trend between 1996 and 2004 (inclusive) (Marriott 2005)
- "Global air freight will average 5.6% growth between 2003 and 2008" (MergeGlobal, Inc. Global Freighter Capacity & Fleet Model)
- "World air cargo traffic will expand at an average annual rate of 6.2% for the next two decades, tripling over current traffic levels."
(Boeing forecast)

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Slide 10: Presentation Contents

- A. What are the environmental critiques of air-freighting agricultural produce?**
- B. Findings of LCAs on food products**