



## Virtual/embedded water content

- **WHAT IS IT?** Virtual/ embedded water refers to the water needed for the production of a crop [ $\text{Crop water requirement (m}^3/\text{ha)} / \text{Crop yield (ton/ha)}$ ]. Origin of the term...
- **WHAT DOES IT TELL US?** It tells us how much water is used for crop growth under different growing scenarios and in different regions. It can also show a nations dependency on other nations for food and fibre products and can also estimate water 'footprints' by evaluating the water content of imports and exports.





# Embedded water content of various items (world averages)

- 1 kg wheat..... 1 m<sup>3</sup>
- 1 kg rice..... 3 m<sup>3</sup>
- 1 kg milk..... 1 m<sup>3</sup>
- 1 kg cheese..... 5 m<sup>3</sup>
- 1 kg beef..... 15 m<sup>3</sup>
- 1 cotton t-shirt..... 4000 litres
- 1 cup of coffee..... 140 litres
- 1 glass of beer..... 75 litres
- 1 sheet of A4 paper..... 10 litres
- 1 hamburger..... 2400 litres





## Green beans and flower study

- Green (fine) beans from Zambia, Kenya and Egypt to UK  
K=15,524 E=2,834 Z=2,362 (2000-2004 t/yr avg.)
- Flowers from Lake Naivasha in Kenya (11,500 t/yr avg.)

### Results will show

- Total, blue & green water use
- Non-evaporative VW content
- Trade volumes
- Water quality issues?
- Explanatory text for methodology





# VW content of green beans to UK...*preliminary results*

	Blue	Green	Total	Non-Evaporative
<b>Kenya</b> (m3/ton)	3,320	1,295	4,614	2,253
(million m3)	51.5	20.1	71.6	35
<b>Egypt</b> (m3/ton)	3,517	0	3,517	3,218
(million m3)	10	0	10	9.1
<b>Zambia</b> (m3/ton)	4,936	958	5,894	3,729
(million m3)	11.7	2.3	13.7	8.7







## Considerations

- Focusing on one crop/product may not be sufficient
- Studies should be specific
- Data demanding
- Linking water quality/quantity issues directly to agricultural use can sometimes be difficult...e.g. Lake Naivasha
- Regional or national studies can tell larger stories
- The UK water dependency on Kenya for example, may be more revealing and interesting
- Evaluating water use and water returns (\$) may help to focus on opportunity costs and better uses of water resources for development
- Environmental flows need to be considered
- Getting water issues on the table and in context is essential for making future development strategies work

