



# WE ARE USING A LOT MORE WATER THAN WE THINK!

**Dr. Frederick Lee**

Faculty of Social Sciences, HKU

January 11, 2019



捐助機構 Funded by:



香港賽馬會慈善信託基金  
The Hong Kong Jockey Club Charities Trust  
同心同步同進 RIDING HIGH TOGETHER



# Outline

1. Water Footprint of an individual
2. How to calculate the Water Footprint of food?
3. Factors that account for differences in Water Footprint of food
4. Why should we care about the Water Footprint of food?
5. How to reduce our Water Footprint?

**PART 1:**  
**the Water Footprint of an individual**



# An individual's Water Footprint



=

***Direct  
water use***

**(real water)**

Drinking

Cooking

Bathing

**219 litres/day**

+

***Indirect  
water use***

**(virtual water)**

Food

Clothes

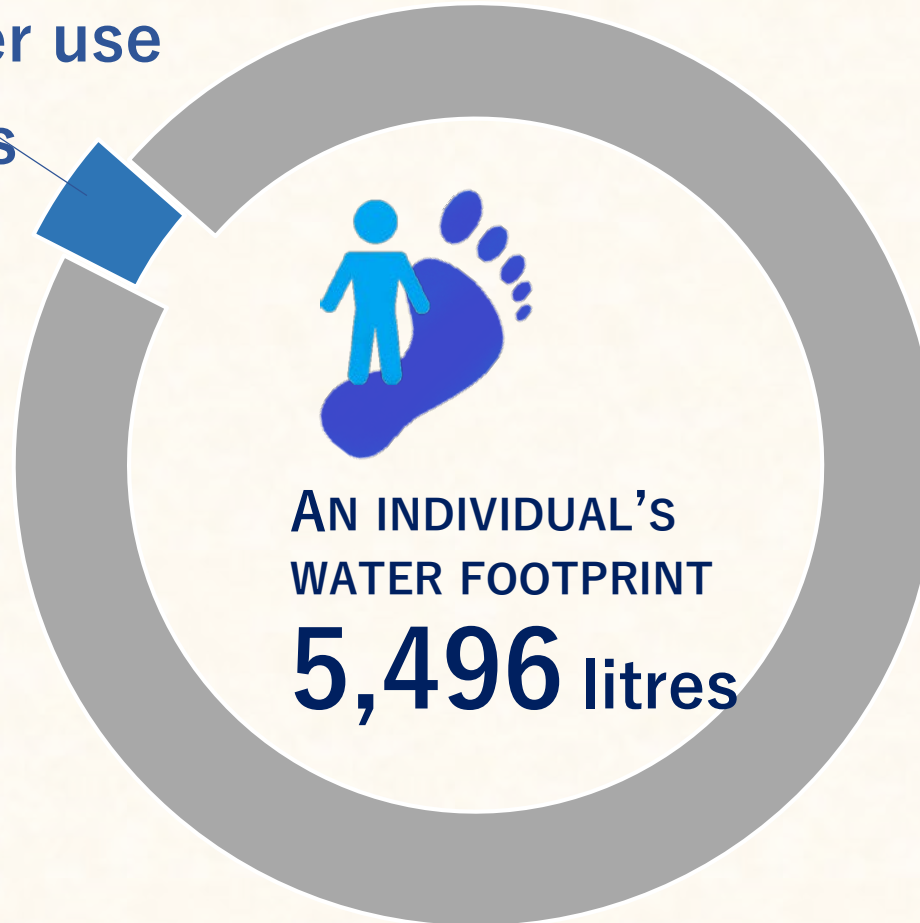
Paper

**? litres/day**

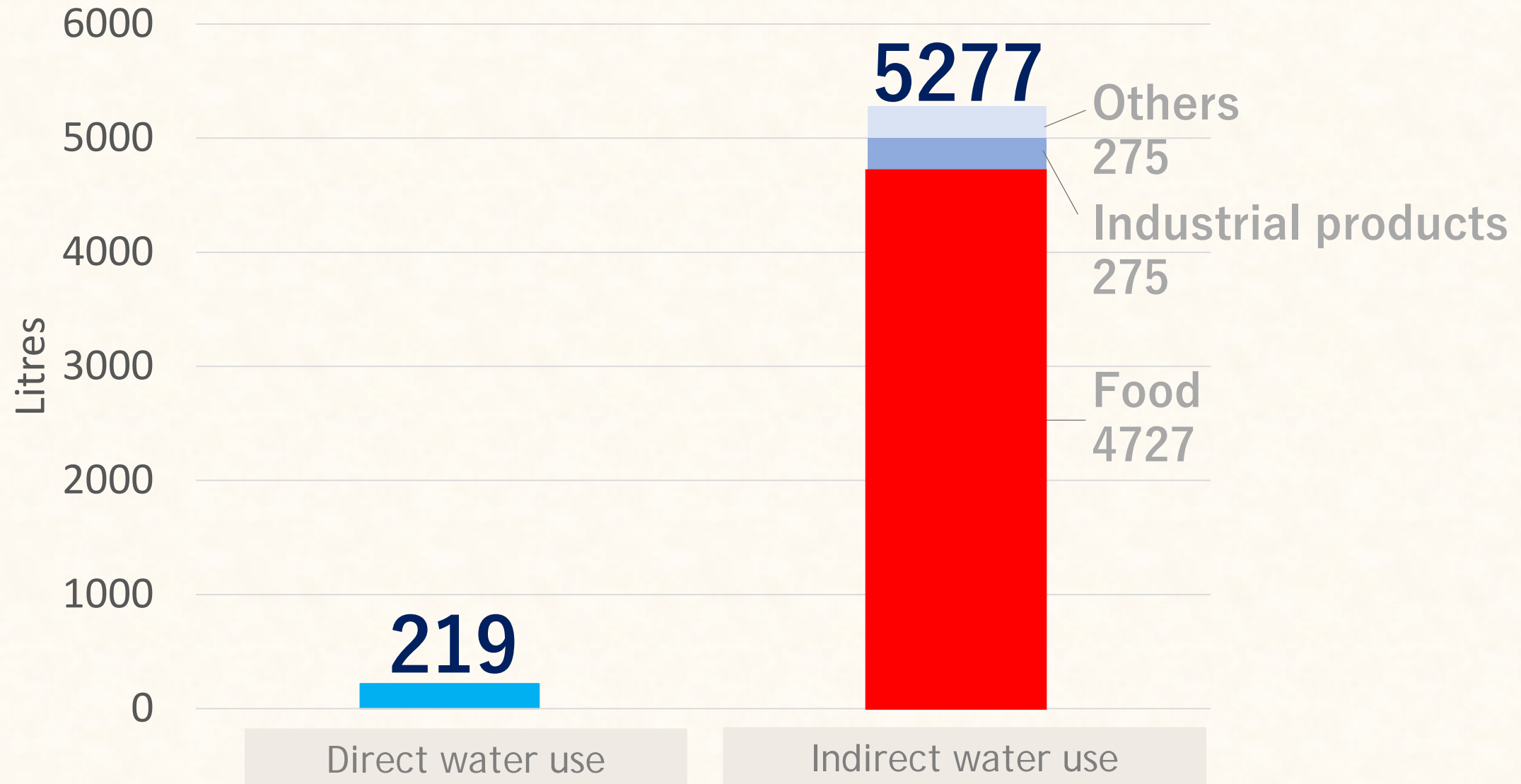
Only **4%** of an individual's Water Footprint  
is related to **direct** water use



Direct water use  
**219** litres



# Indirect water use is 24 times direct water use

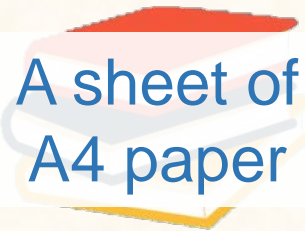


# Indirect water use



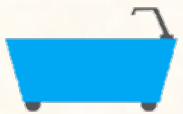
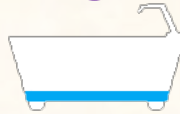
An apple

**205** litres (*virtual water*)



A sheet of  
A4 paper

**10** litres (*virtual water*)



Each bathtub represents  
150 litres of water



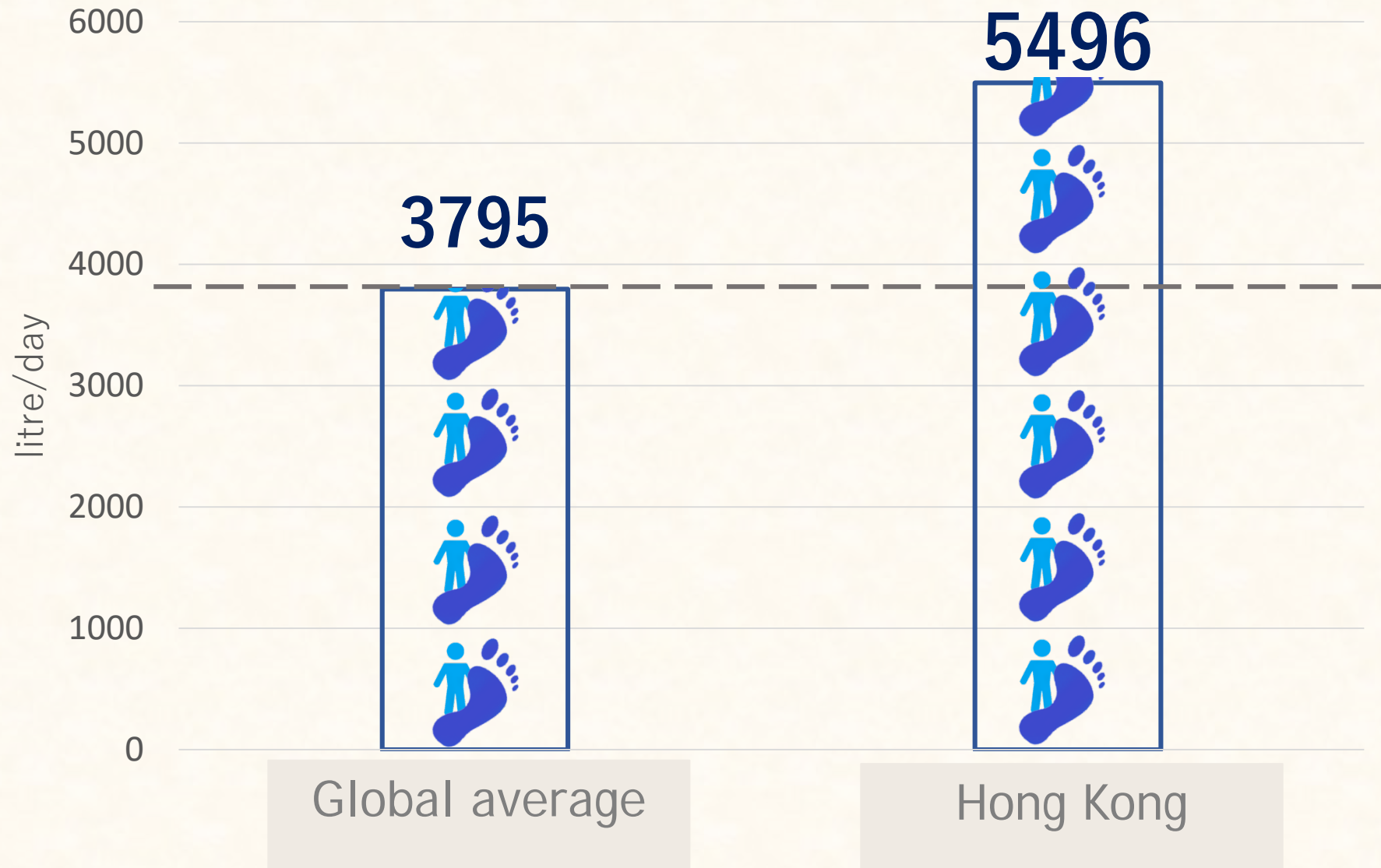
A cotton  
T-shirt

**2000** litres (*virtual water*)





# The Water Footprint of an average person in Hong Kong is **1.4** times that of the global average







# Three Components of Water Footprint



**Green Water Footprint**

- *Rainwater*



**Blue Water Footprint**

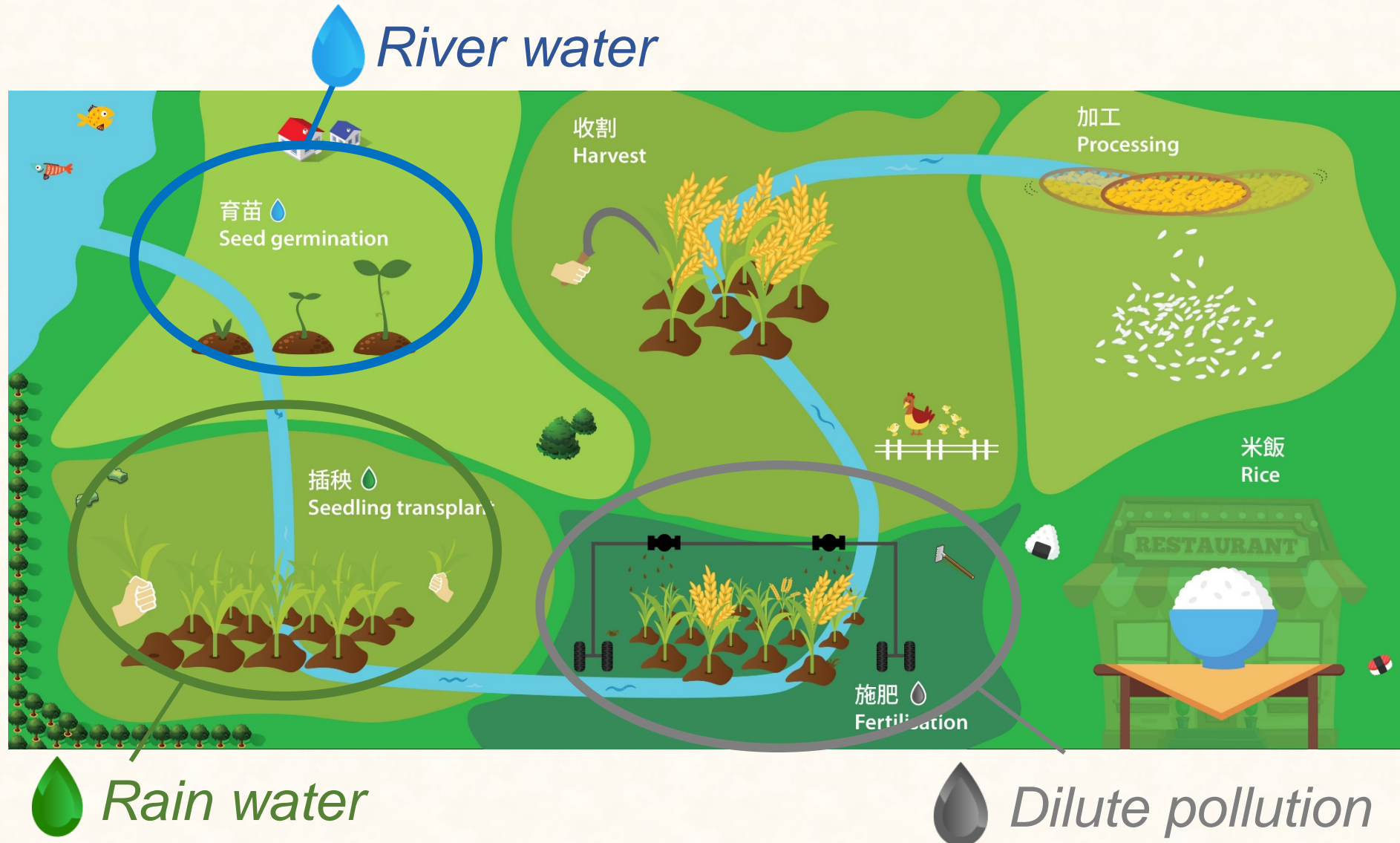
- *River water*



**Grey Water Footprint**

- *Dilute pollution*

# Water resources are used up in each stage of food production process



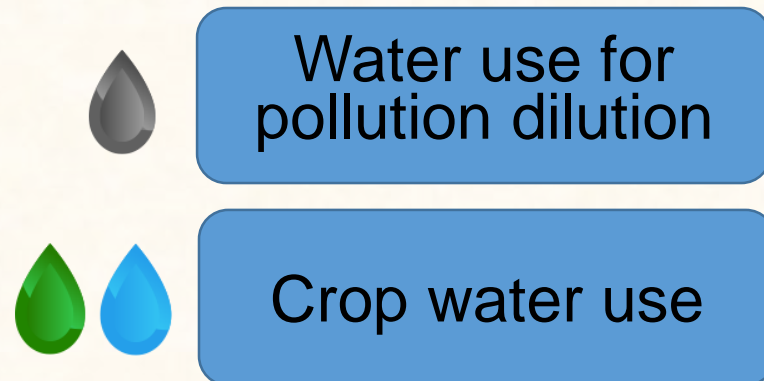
**PART 2 :**

**The Water Footprint of food products**

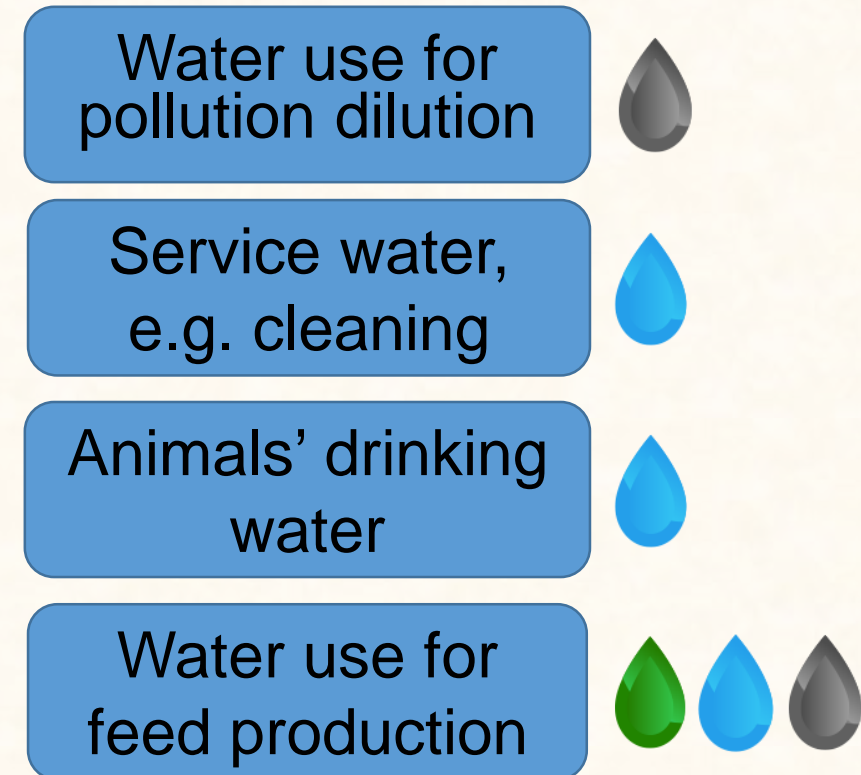


# How do we **calculate** the Water Footprint of food products?

## *Farm produce*



## *Poultry & livestock*





## **PART 3 :**

# **Factors that account for differences in the Water Footprint of food**

# **Factors that account for differences in the Water Footprint of poultry, livestock and farmed fish**

Growth period

Feed  
intake

Composition of  
feed

Process water  
requirements



# Can you guess which food product has a larger Water Footprint?



Chicken, chilled

**4,325** litre/kg



Beef, chilled

**15,415** litre/kg





**A cow consumes much more feed  
than a chicken in its lifetime,  
and hence the larger Water Footprint**

	Chicken	Cow
Growth period	6 to 8 weeks	2 to 3 years
Daily feed intake	$\frac{1}{4}$ pound	27 pounds



# **Why does beef have such a large Water Footprint?**



# Factors that account for differences in the Water Footprint of farm produce

Growth period  
(annual/perennial)

Soil water  
availability

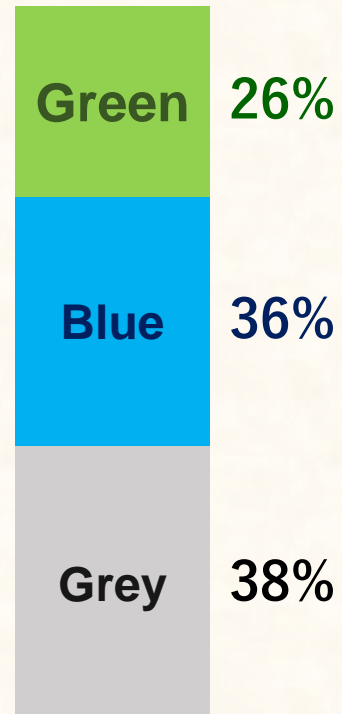
Climate  
(tropical/  
temperate)

Farming practices

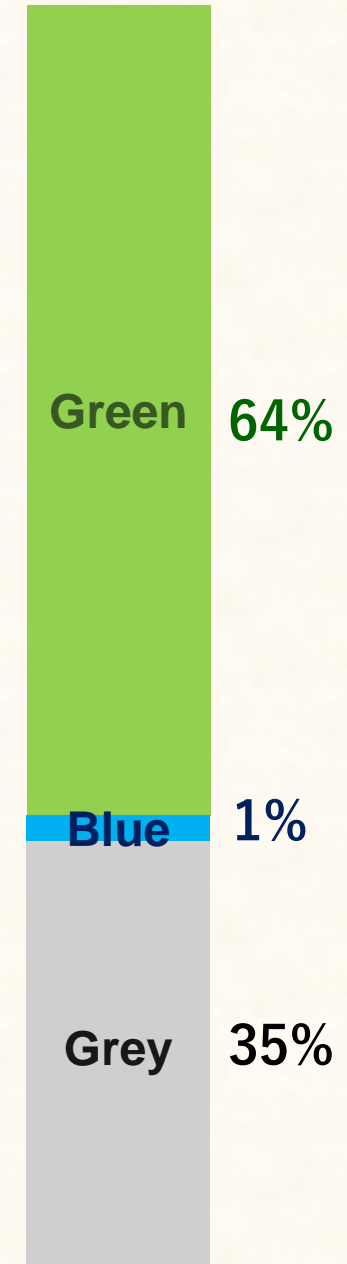


The size and composition of the Water Footprint of food vary according to **agricultural practices** and **irrigation methods**

*Israel*



*China*



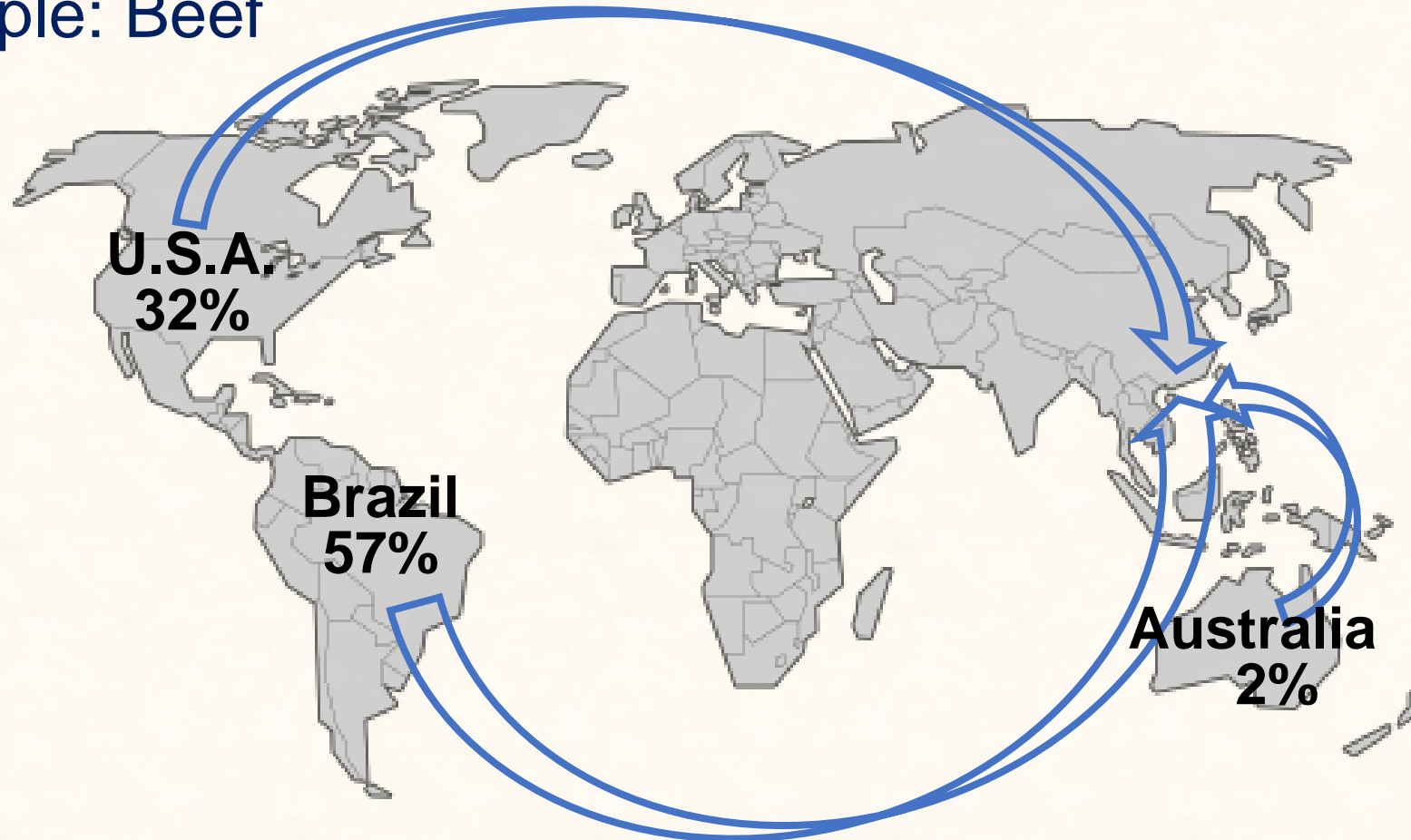
## **PART 4:**

**Why should we care about the Water Footprint of food?**



## While importing foods, we are consuming water resources in other parts of the world

- More than **90%** of Hong Kong's food supply is **imported**
- Example: Beef



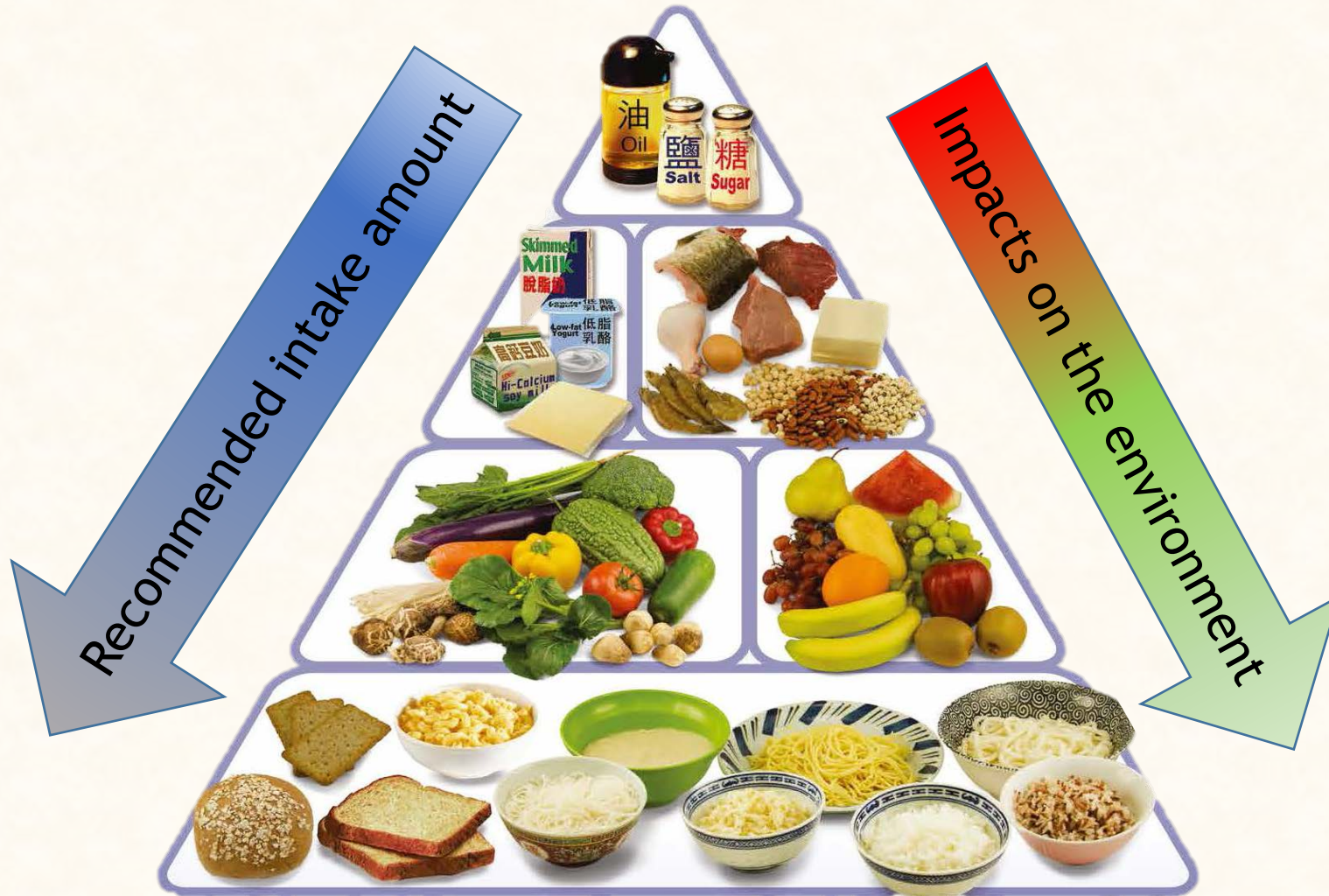
## **PART 5:**

# **How to reduce our Water Footprint?**





Eat **less meat** and eat **more veggie**;  
and we will help conserve water





# Reduce food wastage; and we will help reduce our Water Footprint

- ◆ **3,662 tons** of food waste went to landfills in Hong Kong everyday
- ◆ Equivalent to wasting **4.9 million m<sup>3</sup>** of virtual water



## Conclusion

- ◆ We use far more water than we think
- ◆ Virtual water (embedded in goods) is often neglected
- ◆ Food makes up 90% of our Water Footprint:  
A healthy diet & zero food waste help conserve water



# JC-WISE Water Footprint Calculator

- ◆ HK's first evidence-based Water Footprint Calculator ([www.jcwise.hk/wfc](http://www.jcwise.hk/wfc))

- ◆ Mobile app:  
For both iOS & Android







# Water Footprint of our meals

*Let's find out the virtual water content of meal (A):*

**Total: 1,322 litres**



Satay beef burger  
1,254 litres



Lemon tea  
66 litres



*Let's find out the virtual water content of meal (B):*

**Total: \_\_\_\_\_ litres**



Steamed pork  
dumplings

\_\_\_\_\_ litres



Steamed shrimp  
dumplings

\_\_\_\_\_ litres



Oolong tea

\_\_\_\_\_ litres



# JC-WISE Water Footprint Calculator

- ◆ HK's first evidence-based Water Footprint Calculator ([www.jcwise.hk/wfc](http://www.jcwise.hk/wfc))
- ◆ Mobile app:  
For both iOS & Android

