



The implications of the avocado trade for global water scarcity



Introduction

The popularity of avocado consumption has been soaring across Europe and the United States, but what this implies for global freshwater resources is not well understood. **The aim of this project** was to estimate trends in the global blue water usage for the avocado production and to explore the implications for water scarcity in the production locations, **with the following objectives:**

1. Calculate the change in demand for exported avocados from 1990-2015
1. Calculate the oscillating production trends and the quantity of blue water required to meet the production needs for irrigation
2. Estimate the impacts of global trends in the avocado production on global blue water scarcity using a foot-printing approach.

Methodology

The blue water scarcity footprint of avocado

$$\text{Avocado quantity} \cdot \text{Blue water} \cdot \text{SI} = \text{WSF (m}^3 \text{ H}_2\text{Oe)}$$

Source: International Organization for Standardization [ISO], 2014

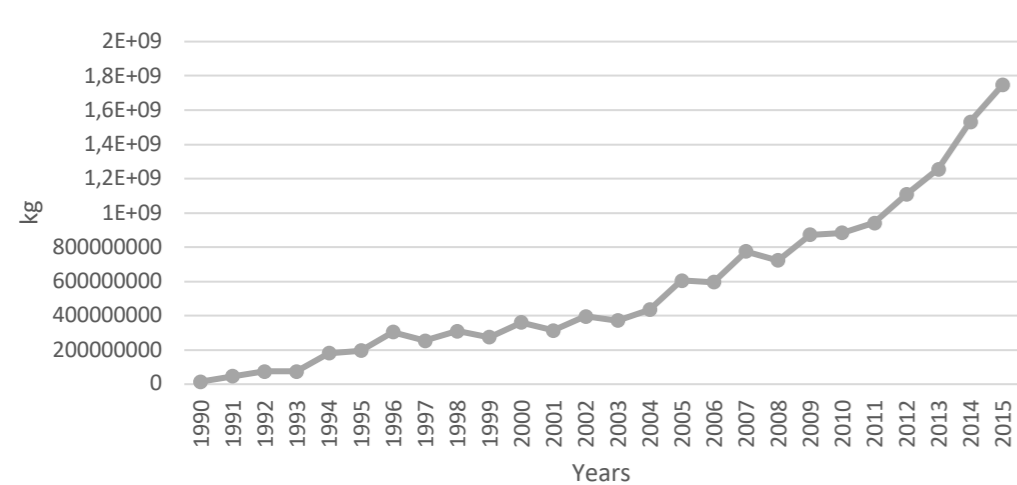
- Avocado quantity: The production data was obtained from FAOSTAT, import and export data were obtained from UN Comtrade
- Blue water : The blue water of each avocado producing country (Mekonnen & Hoekstra, 2011)
- Scarcity Indicator Value (SI) The water scarcity factors for each country (Wulca, 2014)

Assumption: The 1990-95 average was taken as a baseline period against which the 2010-15 average was compared

Results

Objective 1

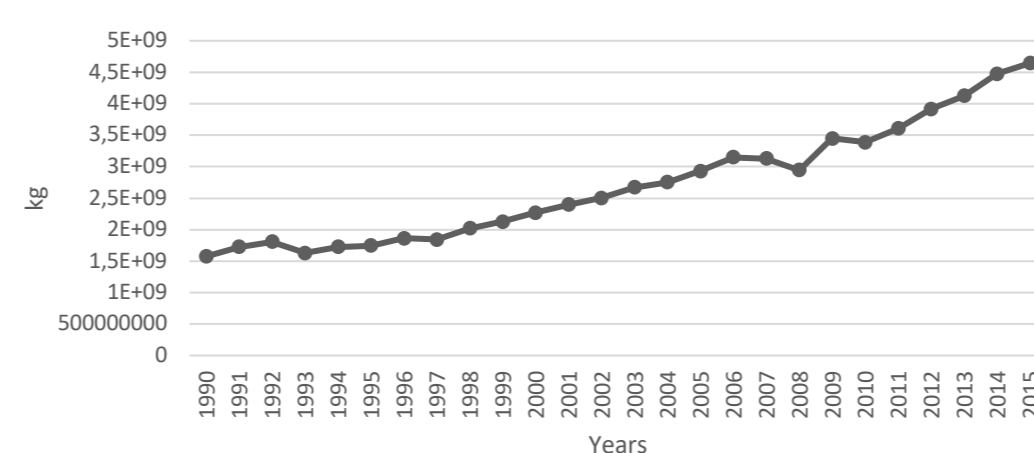
Annual global demand for exported avocados over 1990-2015



	1990	2015
Annual global demand (Kg)	230 million	1301 million

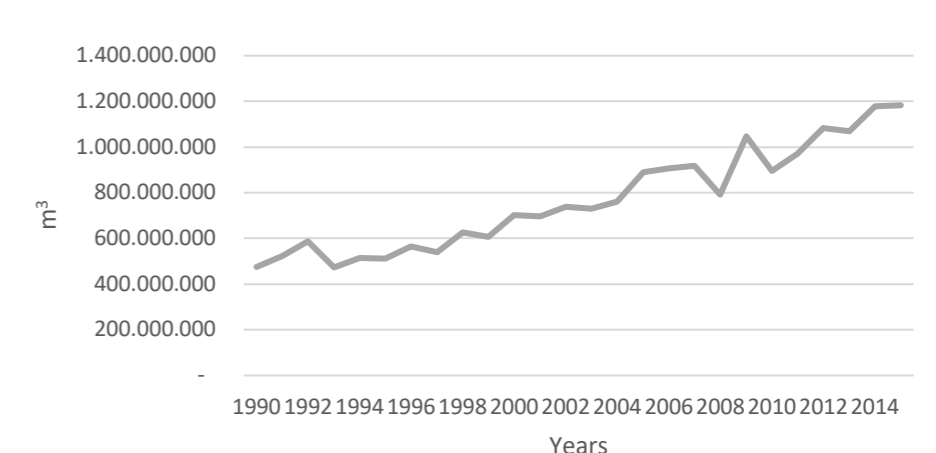
Objective 2

Annual global production over the period 1990-2015



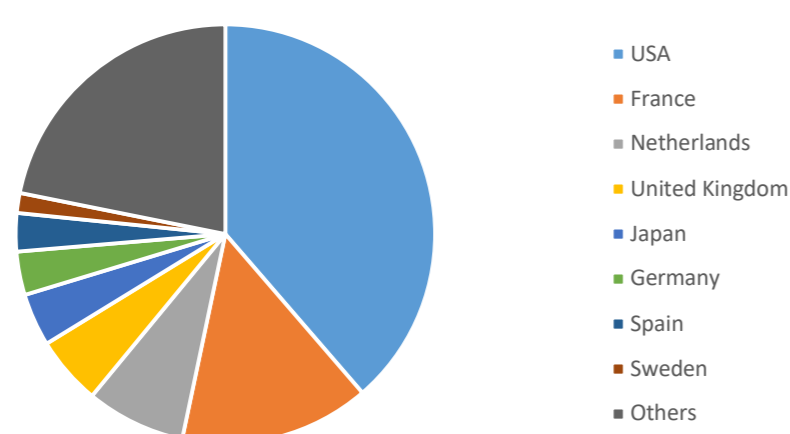
	1990	2015
Annual global production (Kg)	1700 million	4000 million

The total annual quantity of blue water used globally for avocado production over the period 1990-2015



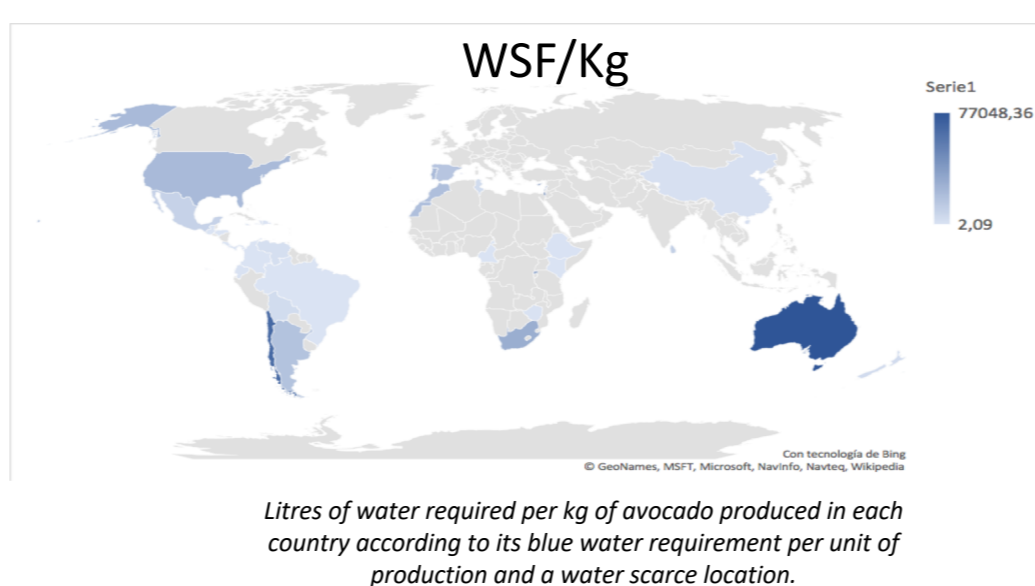
	1990	2015
Blue water (m³)	523 million	1058 million

Top avocado demanding countries



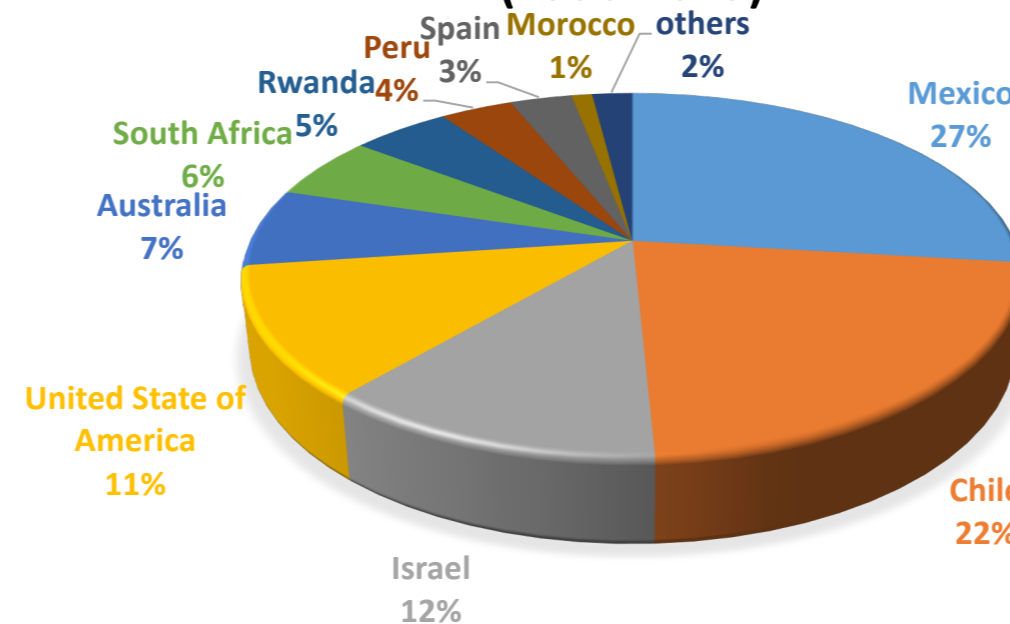
Supply per capita

	Kg/year/person							
	USA	France	The Netherlands	The UK	Spain	Japan	Germany	Sweden
1990	0.61	1.28	0.24	0.22	0.47	0.03	0.12	0.49
2015	0.71	1.37	0.13	0.66	0.81	0.41	0.33	1.91
% Increase	16	7	-45	185	71	1407	174	287



Litres of water required per kg of avocado produced in each country according to its blue water requirement per unit of production and a water scarce location.

The % of WSF main avocado producing countries (1990-2015)



The WSF main avocado exporting countries (1990-2015)

	WSF (Million m³ H ₂ Oe)	
Countries	1990	2010
Chile	791	6500
Israel	2014	2120
Mexico	206	4641
USA	450	2857
South Africa	814	1413
Spain	395	735
Peru	2	927

Conclusion

Avocado has become one of the tropical fruits with greater demand. Over the period 1990-2015, growing demand for imported avocados in the USA, the Netherlands, the United Kingdom, Sweden and Japan has increased its production in countries such as Mexico, Chile, Israel, USA, Australia and South Africa, leading to an increase in the blue water scarcity in said locations. Given the projected impacts of population growth and potential impacts of climate change on the availability of global freshwater resources, this trend is unlikely to be sustainable in the long term.

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