



# Optimising Water Use in Scotland: Valuation, Tradability and Portfolio Theory

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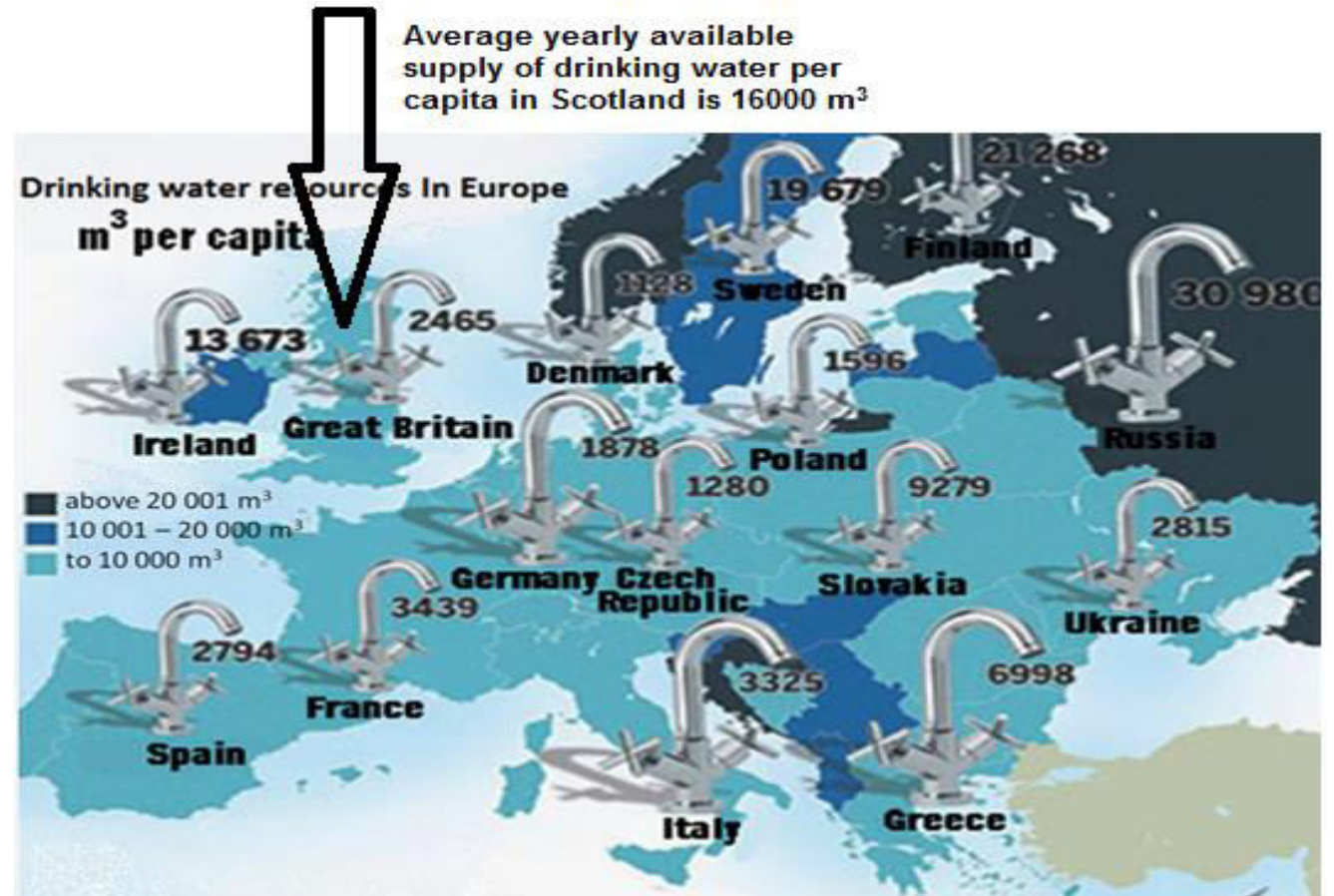


# Overview of the Presentation

- Research objectives
- Methodology
- Current progress
- Contribution

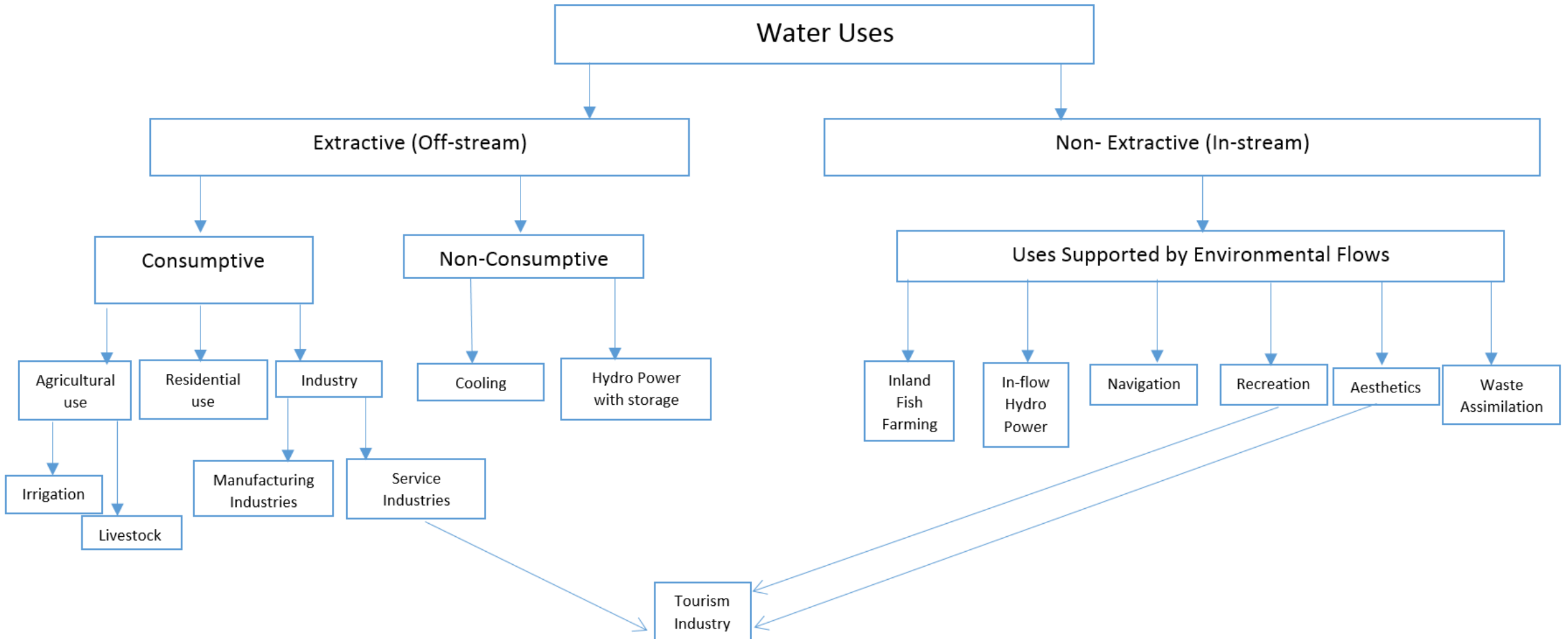
# Research Questions

- What is the value of water available in Scotland?
- How can this current value be optimised?

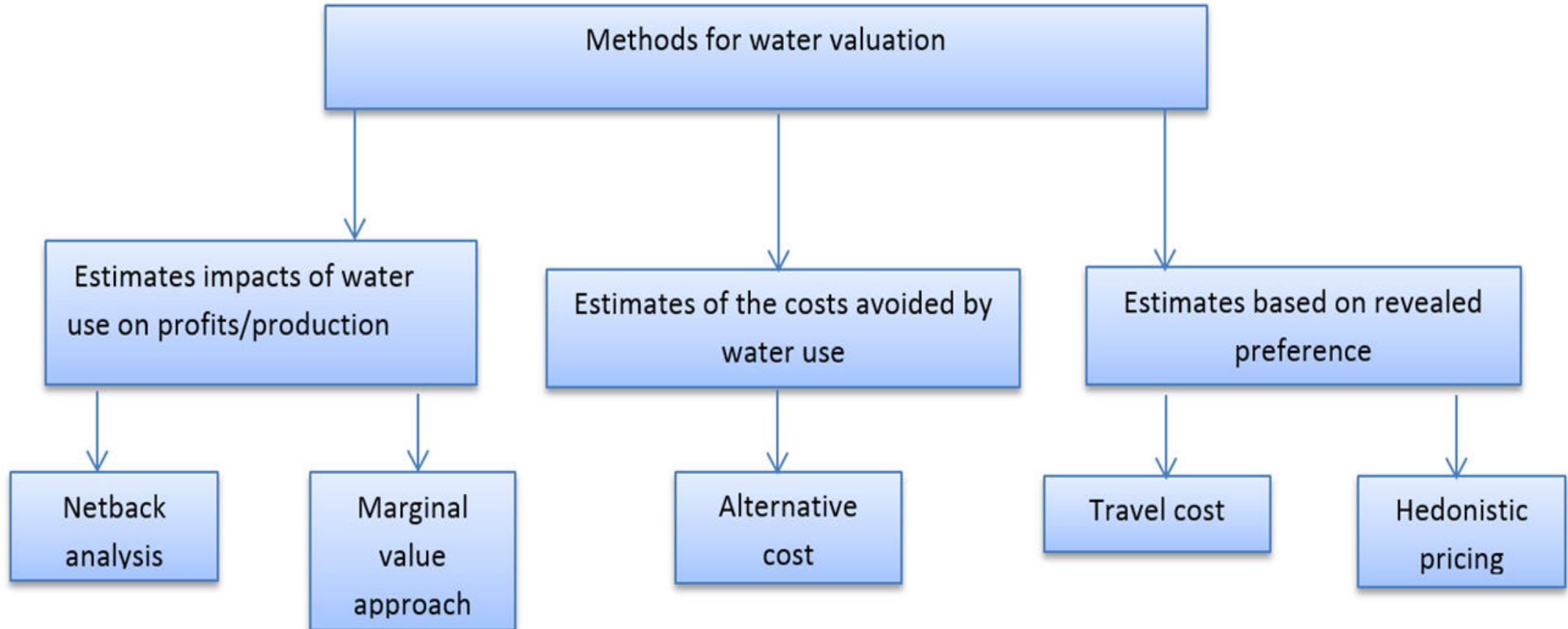


Source: Ostojski et al. (2012). Water Availability in Reference to Water Needs in Poland and Scottish Office (1998), Scottish Environment Statistics

# Categorisation of Water Demands



# Economic Valuation of Water Uses



Source :compiled from Renzetti (2002)

# Approaches used to estimate values of different water uses in Scotland

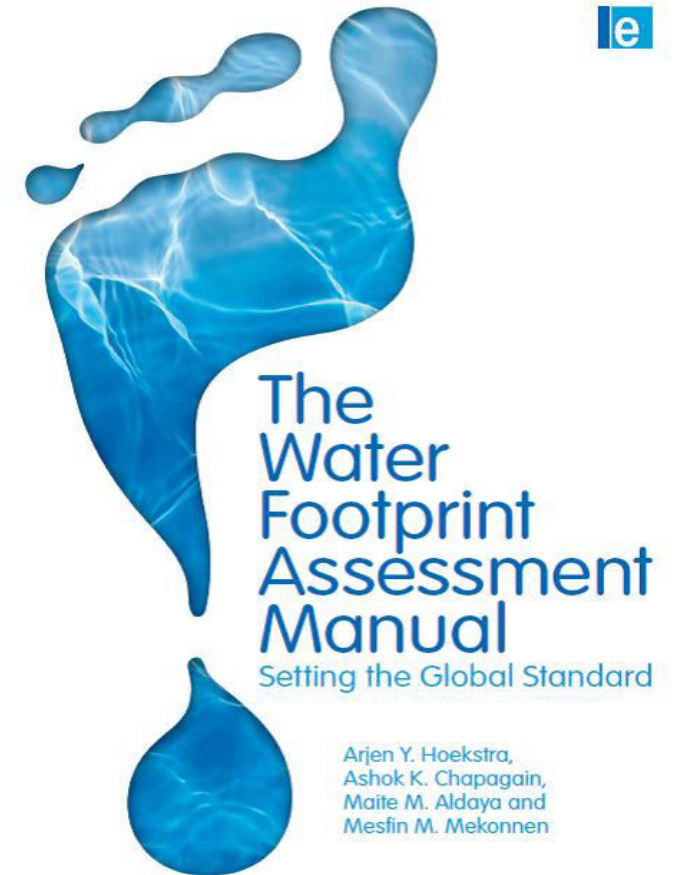
Consumptive Water Uses	\$/m <sup>3</sup> (£//m <sup>3</sup> ) in 2015	Price Elasticity
Manufacturing industries	2.8 (1.96)	-0.23
Service industries	3.81 (2.67)	-0.24
Irrigation	0.11 (0.077)	-0.509
Residential	In progress	-0.365

Source: service industries adapted from Angulo et al. (2014), irrigation value estimate adapted from Latinopolus (2003) and price elasticity adapted from Scheierling et al. (2006), residential price elasticity adapted from Sebri (2014) and the value estimate will be reported from the Scottish Water.

# Water Footprinting

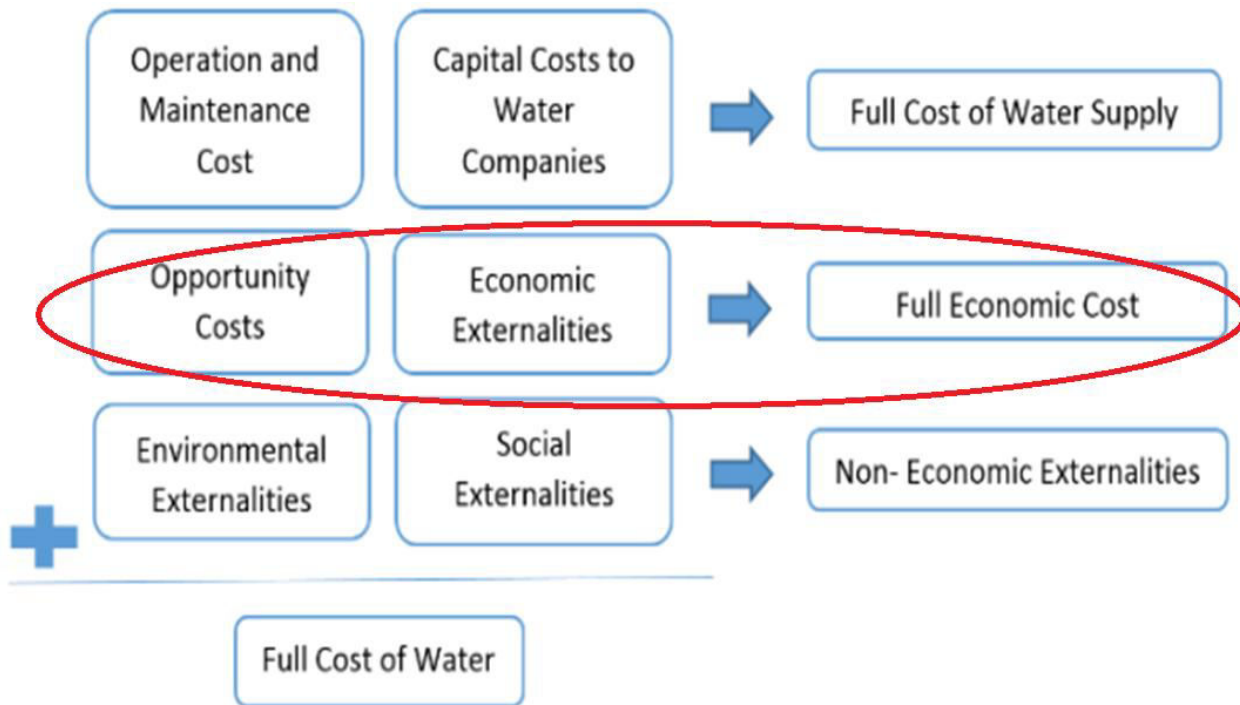
Case studies:

- Scotch whisky industry (Single malt)
- Livestock industry (Cattle)

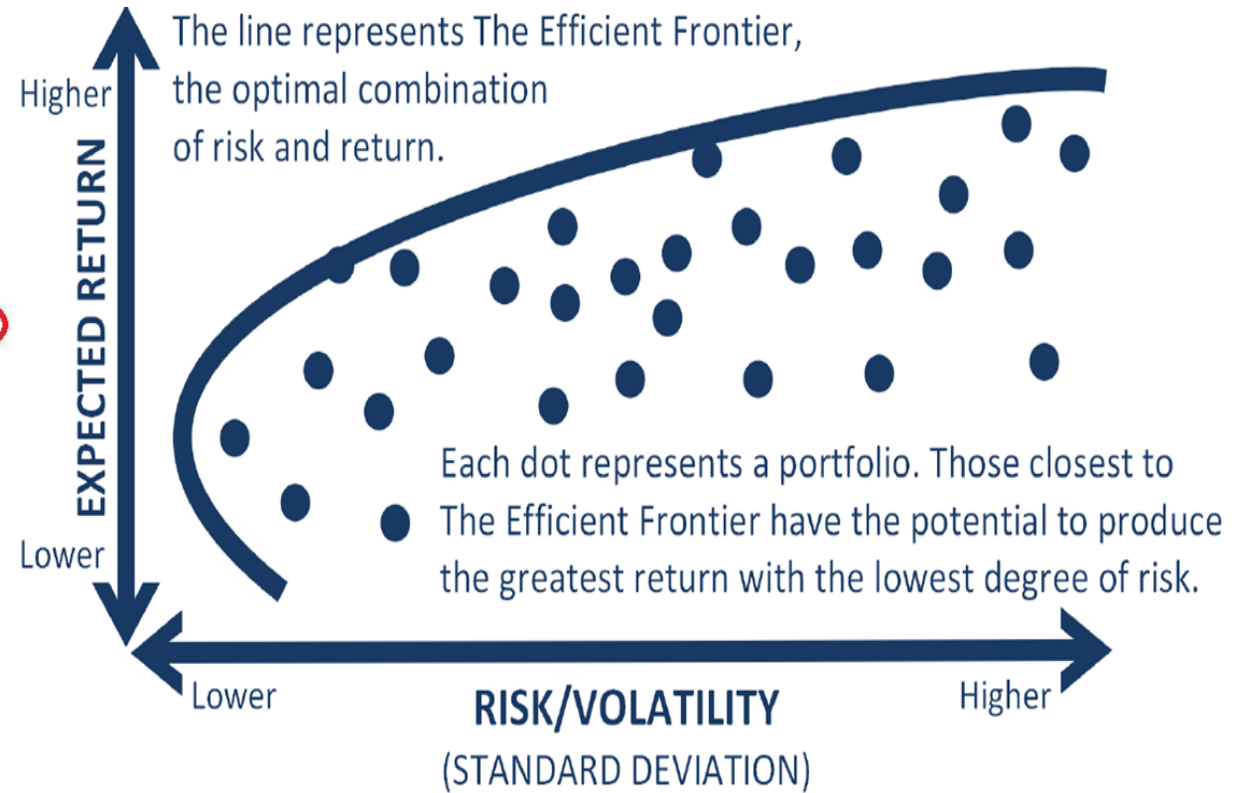


Source: Hoekstra, A. Y. et al. (2011) The Water Footprint Assessment Manual: Setting the Global Standard

# Trading Water through Portfolio Optimisation



Source: Lester, R. T. (2003). The Real Cost of Water, Siglo XXI.



Source: API Funds and Portfolios, 2014. The Efficient Frontier and Modern Portfolio Theory.



# Contribution to the Hydro Nation Agenda



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Programme

- value of water to the economy, society and the environment
- economic regulation of water climate change adaptation
- multiple benefits of water resource management
- international best practice and their possible implications for the Hydro Nation Policy.

The University of Edinburgh  
**GeoSciences**



**Thank you!**  
**Any questions ?**



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