

# Introducing kiwifruit water footprint into a traceability IT system

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<https://www.kiwiaware.eu/>

This research work is funded by the Operational Programme “Epirus” 2014-2020, under the project “Modern kiwi quality assessment system, traceability of kiwi product and intelligent supply chain management based on advanced IT applications ICT-Foodaware”, Co-financed by the European Regional Development Fund (ERDF) and national funds.



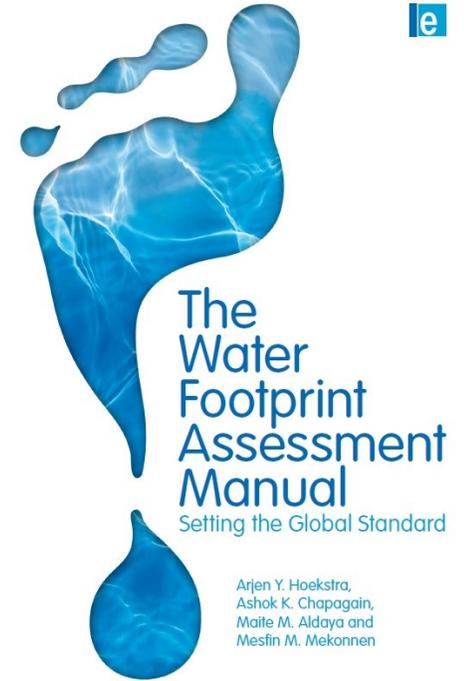
# Framework

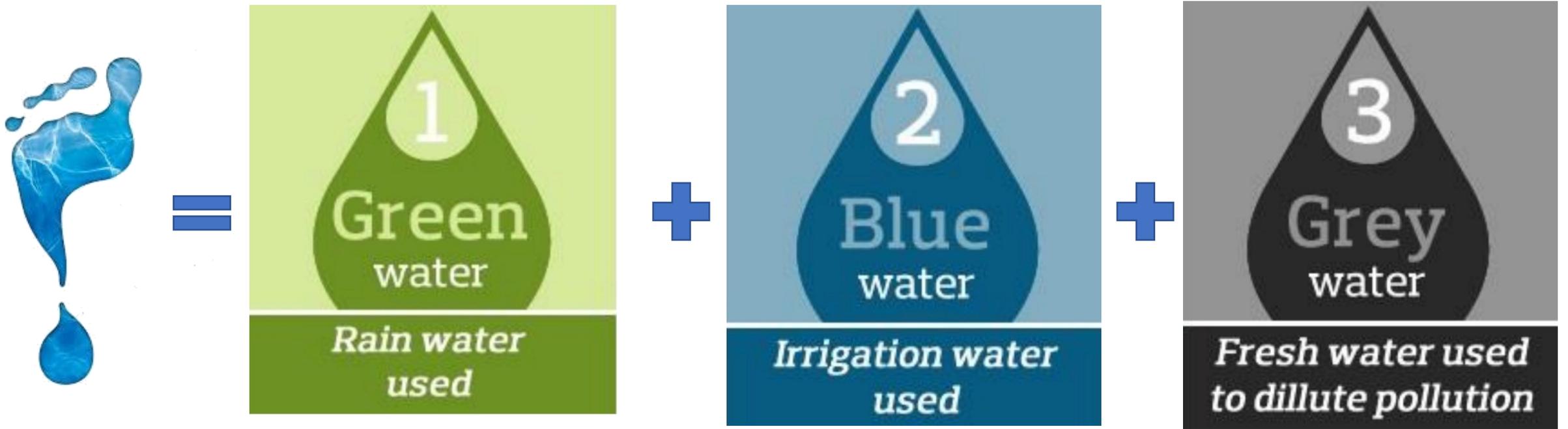
- **Water scarcity** is a major global risk
- **Agriculture** is the most significant water user in many countries
- Greek **kiwifruit** production is constantly growing, especially during the last decade.
  - *The **plain of Arta** is among the hotspots regarding kiwifruit culture in Greece.*
  - *The **irrigation water requirements** of the crop in that area are high, while **fertilisers** are usually provided to the crop via **fertigation methods**.*



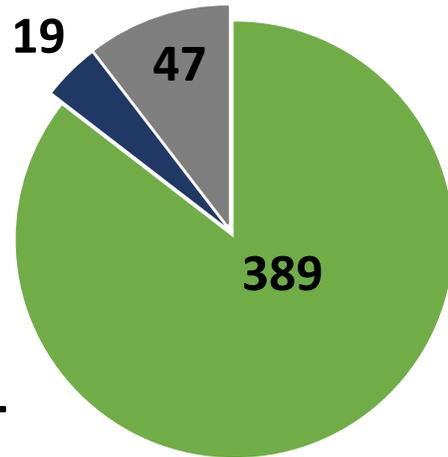
# Framework

- **Water Footprint (WF)** is an index that accounts for the amount of water used along a part or the full supply chain of a product
- WF could **connect water and cultivation inputs management of kiwifruit cultivation in a single index**
- An innovative **web application**, which includes **calculation of cultivation WF**, was developed and tested for the case of kiwifruit cultivation in the plain of Arta





**455 L kg<sup>-1</sup>**



**New Zealand**

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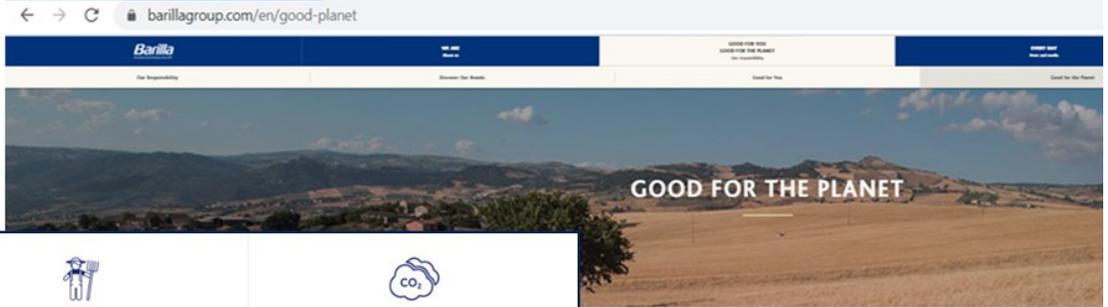


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# Description and main features of the application

- The web application is designed to handle data regarding the full range of cultivation practices of kiwifruit (pruning, irrigation, fertigation, plant protection, harvest etc.), along with data from soil analysis, weather conditions, fruit quality analysis and yield
- **The cultivation WF is calculated taking into account the green, blue and grey components of the index**
- The application provides to farmers, agriculturalists, processors, traders, consumers etc., traceability information regarding kiwifruit cropping practices as well as information regarding the WF of the fruits

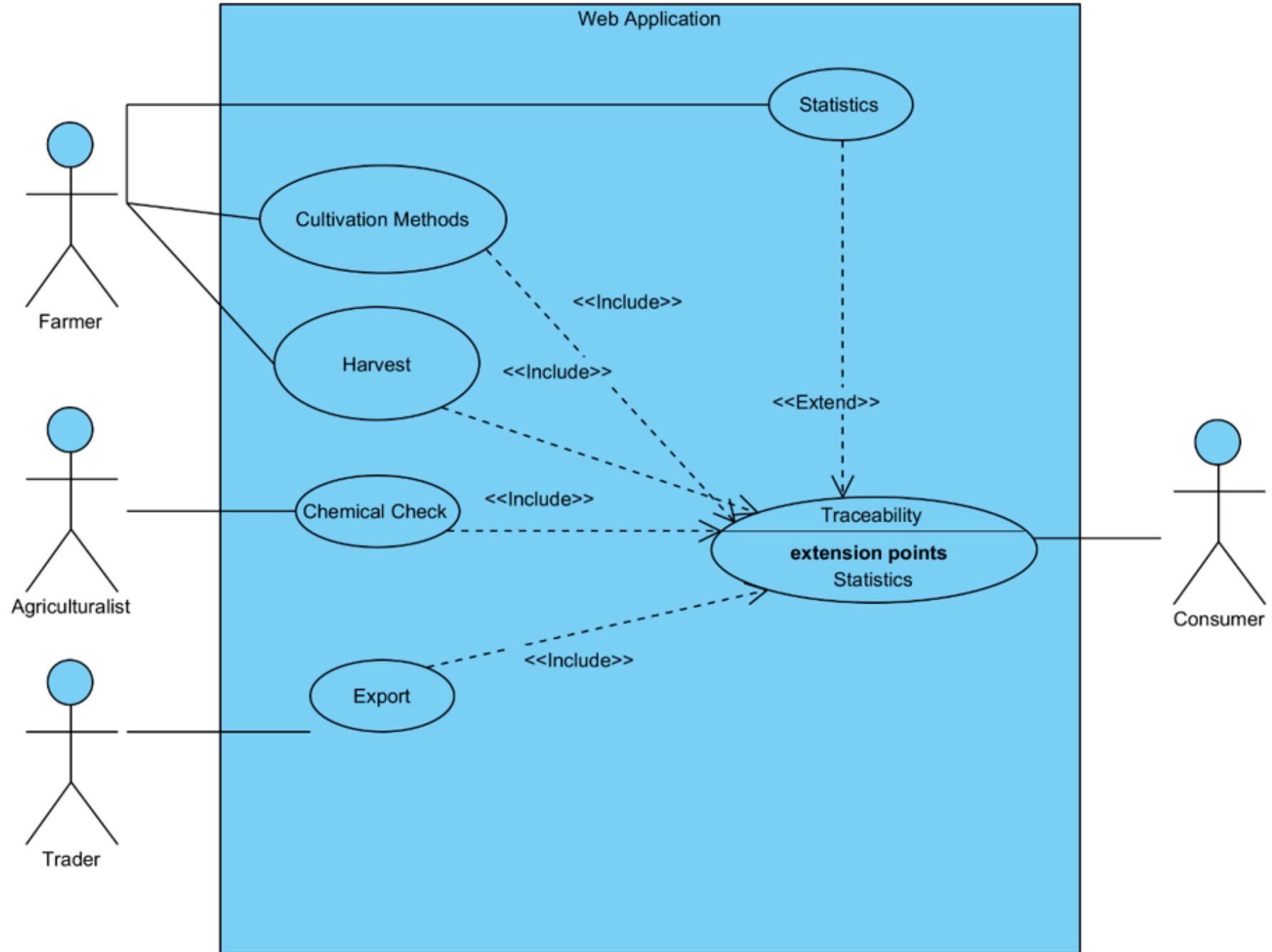
# Description and main features of the application

The application is consisted by two main components:

1. the data gathering part used for the traceability of kiwi and
2. the data mining used for generating various statistics regarding the kiwifruit and the farms

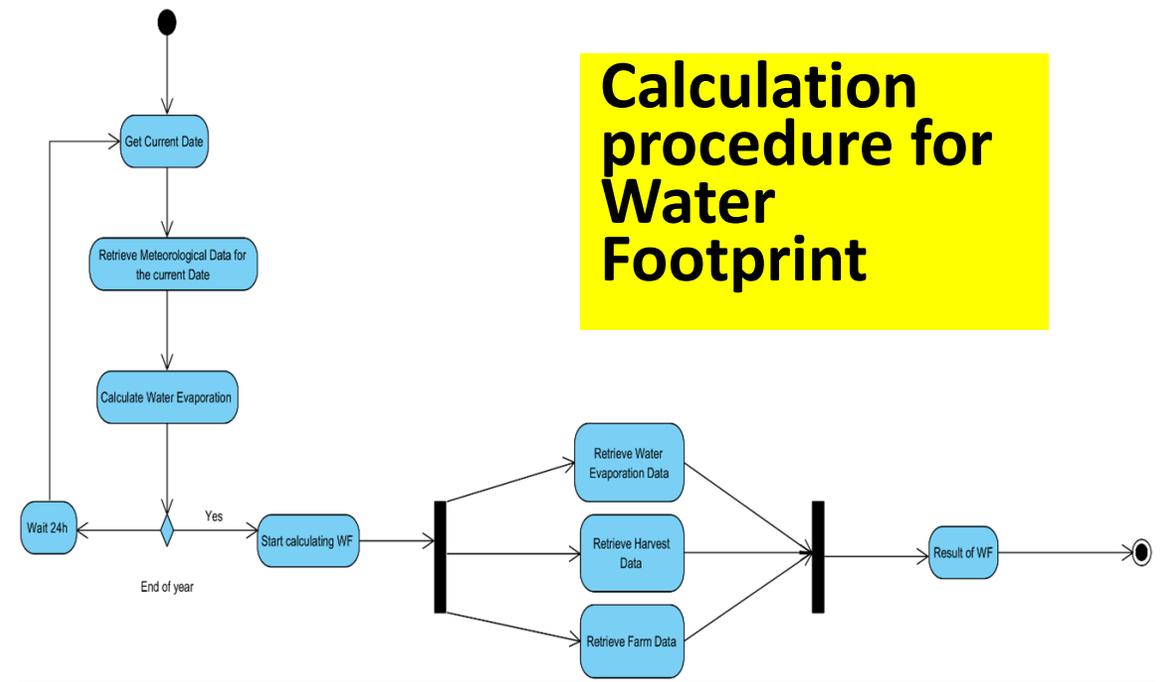
# Description and main features of the application

**Data gathering and dissemination flow chart**

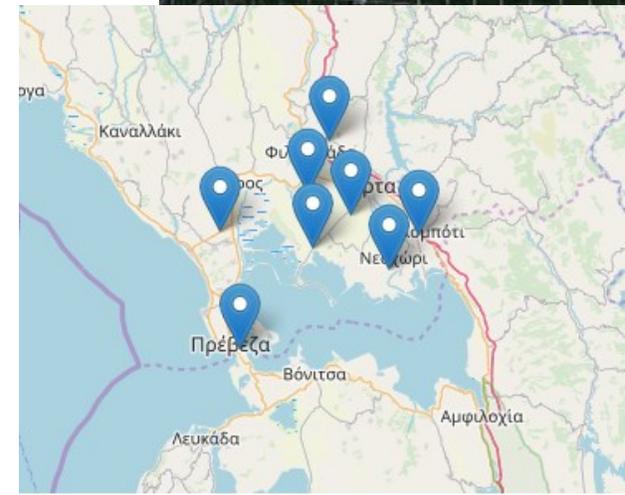


- **On a daily basis, calculates and stores the crop evapotranspiration (ETc) and effective rain** to the database by using data from local agro-meteorological stations
- **Cultivation inputs and yield data are entered by the user**
- At the end of the year, the system **calculates the green, blue and grey components of the WF** according to the methodology proposed by WFN

Description  
and main  
features of  
the  
application



# Description and main features of the application



**Calculation procedure for Water Footprint**

# Blue Crop Water Use ( $CWU_{blue}$ )

min  
Crop water need, Efficient  
irrigation



Yield



# Green Crop Water Use ( $CWU_{green}$ )

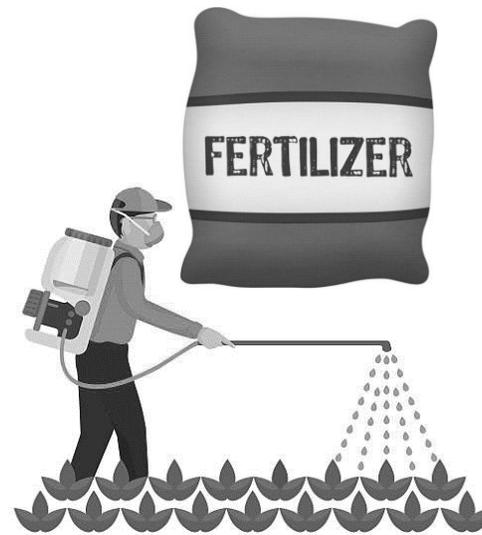
min  
Crop water need,  
Efficient rainfall



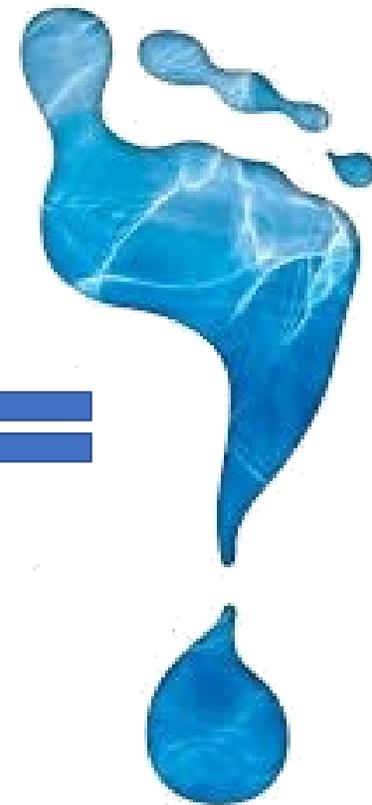
Yield



# Volume of fertilisers and plant protection inputs



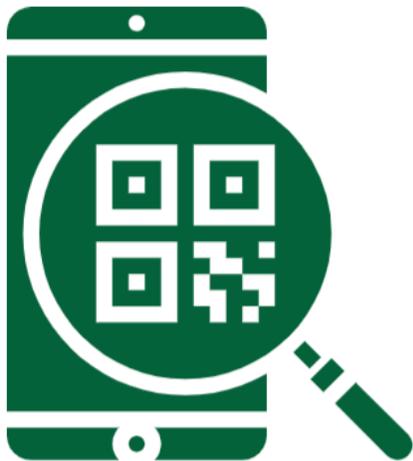
Yield



# Results regarding kiwifruit Water Footprint

During the test period of the application, it was found that the average cultivation WF of kiwifruit in orchards supervised by Kolios Fruit S.A. in the Arta plain is equal to  $335,47 \text{ m}^3 \text{ tn}^{-1}$

The application will be soon available to anyone interested through the project's website: <https://www.kiwiaware.eu/>



**Food** **Aware**

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