

IMPROVING PREDICTIONS AND MANAGEMENT OF HYDROLOGICAL EXTREMES



D12.1

Dependencies of Europe's economy on other parts of the world
in terms of water resources



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Author(s):	Dr. Ertug Ercin, Daniel Chico Zamanillo, Dr. Ashok Chapagain
Contact for queries	ertug.ercin@waterfootprint.org
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Acronyms

FAO – Food and Agriculture Organization of the United Nations

FBS – Food Balance Sheet

HS - Harmonized System

ITC - International Trade Centre

SITC - Standard International Trade Classification

MRIO – Multi Regional Input Output analysis

USA – United States of America

WF – Water Footprint

WFA – Water Footprint Assessment

WFN – Water Footprint Network



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Executive summary

Water, like energy, is a key input into any economy. With variations in water availability and quality from country to country, water is a local issue. At the same time, because of international trade in goods to meet the needs of the world's populations, water is a global, collective resource. International trade in commodities implies long-distance transfers of water in virtual form, where virtual water is understood to be the volume of water that has been used to produce a commodity and that is thus virtually embedded in it. Knowledge about the virtual water flows entering and leaving a region can cast a new light on the meaning of water dependencies of a region's economy and its susceptibilities outside its borders.

The European economy is dependent on water resources elsewhere in the world. Many of the goods consumed in the European Union (EU28) are not produced domestically, but abroad. Some goods, in particular agriculture-based products, require a lot of water during production. These water-intensive production processes are dependent upon the availability of water at the various locations where the production processes take place. Their production may be vulnerable to different factors ranging from reduced river flows, lowered lake levels and declined ground water tables to increased salt intrusion in coastal areas, pollution of freshwater bodies, droughts and a changing climate. This report maps the current vulnerabilities of the European economy related to water scarcity and drought occurrence in the countries of origin of imported products.

This assessment uses the water footprint to understand the degree of the EU's global demand for freshwater resources for its economic activities i.e., for production, consumption and import. The water footprint is comprised of three components – the green, blue and grey water footprint. The green water footprint is water from precipitation that is stored in the root zone of the soil and evaporated, transpired or incorporated by plants. It is particularly relevant for agricultural, horticultural and forestry products. The blue water footprint is water that has been sourced from surface or groundwater resources and is either evaporated, incorporated into a product or taken from one body of water and returned to another, or returned at a different time. Irrigated agriculture, industry and domestic water use can each have a blue water footprint. The grey water footprint is the volume of water required to assimilate pollutants such that ambient water quality standards are maintained.

In order to assess the vulnerabilities of the European economy to stresses on external water resources, the current water footprint of production and consumption in Europe are quantified. The water footprint of *production* is the volume of local water resources that is used to produce goods and services within the EU. This includes the water footprint of agriculture, industry and domestic water use and tells us the total volume of water and assimilation capacity consumed within the borders of the EU. The water footprint of *consumption* is the volume of water used to produce all the goods and services that are consumed by the people living in the EU. This water footprint may be partly inside the region and partly in other countries, depending on whether the products are locally produced or imported. When products are imported from another region, the volume of water consumed in producing those products is considered as virtual water import.

The virtual water import to the EU is calculated separately for green, blue and grey components related to all internationally traded commodities. Key crops imported to the EU are identified based on the size of imported virtual water, and their production locations were mapped per

component of total virtual water imported. For each location, an assessment of water footprint, drought severity and water scarcity helps identify the EU's external water dependencies and showed when and where vulnerabilities may lie, in terms of blue water scarcity and drought.

The water footprint of production and consumption for Europe and the virtual water flows is calculated for the period of 2006-2013, both for individual years and as an average. The water footprints of production and consumption for the EU for this period are 517 km³ and 600 km³ per year on average, respectively. The water footprint of consumption for Europe has been significantly externalised to other parts of the world; around 40% of Europe's water footprint of consumption lies outside the region for the period 2006-2013.

Crop products make up the largest share of the virtual water import to the EU (72%), followed by industrial products (22%) and animal products (6%). Soybean products account for 27% of the total green virtual water import to the EU, followed by cocoa products (19%), coffee products (14%), palm oil products (9%) and animal products (8%). The blue water footprint of products imported to the EU is 14 km³/year. Approximately 32% of this blue water footprint is due to industrial products. Other products with a significant share in the blue virtual water imports are: rice (9%); sugar cane (7%); cotton (7%); almonds (4%); pistachios (3%); animal products (3%); grapes & wine (3%); and soybean products (3%). The grey water footprint of imported products is 77 km³/year. Industrial products make up the largest share of the grey water footprint (88%), followed by coffee products (2%), palm oil (1%), almonds (1%), pulses (1%), maize (1%), soybean (1%), beans (1%) and tobacco and related products (1%).

The majority of the total virtual water imports to the EU originate from: Brazil (16%); Ukraine (12%); Argentina (8%); Indonesia (7%); Ivory Coast (6%); Russia (5%); the USA (4%); China (3%); Ghana (3%); India (3%); and Malaysia (3%). The USA (17%), India (9%), Pakistan (8%), Turkey (6%), Egypt (6%), Iran (4%) and South Africa (4%) are the largest blue virtual water exporters to the EU with regard to crop products, accounting for 53% of the blue virtual water import.

Overall, the European economy is 41% dependent on external green water resources, which is categorized as a "moderate dependency". Soybean, pistachios, cotton, sorghum, avocados, hazelnuts and rice are some products for which the European economy has a "high dependency" on external green water resources. There is an "absolute dependency" on external green water resources for products which are not grown in Europe, such as coffee, cocoa, palm oil, coconuts, tropical fruits, vanilla, sugar cane and tea. The dependency of the European economy on external blue water resources (surface and groundwater) is only 30%, which is considered as a "low dependency". This dependency is 39% with respect to industrial products and is significantly larger for some crops such as sugar cane, coffee, dates, tea and vanilla, for which there is an "absolute dependency". For pistachios, bananas, tobacco and avocados there is a "very high dependency" and for almonds, hazelnuts and soybean, there is a "high dependency".

Key products are identified separately for the green and blue virtual imports in order to assess vulnerabilities due to drought (green component) and water scarcity (blue component). Soybean, cocoa, coffee, palm oil, sunflower, maize and olives are selected as key products from the perspective of green virtual water import and represent around 81% of the total green virtual water import to the EU. Soybean is the crop with the largest virtual water import volume to the EU with imports coming from Argentina, Brazil and the USA. Europe relies on soybean imports to meet the demand for meat and dairy products. In relation to European demand, little soybean is grown in the EU and its cultivation has important economic and political implications. Around



99.5% of soybean related green virtual water import to the EU comes from locations with a low drought risk, thus the vulnerability level is categorized as “low”. Similarly to soybean, the vulnerability level of more than 90% of the green virtual water imports related to other key products is determined as “low”. Olives are sourced from locations with a “moderate” vulnerability level, mainly in Tunisia.

The key products for blue virtual water import are rice, sugar cane, cotton, almonds, pistachios, grapes and soybean, which represents 54% of the total crop related blue virtual water import into the EU. These key products are sourced from areas under significant or severe water scarcity, thus making the majority of blue water imports highly vulnerable. Ninety-one percent of the blue virtual water for almonds imported into the EU is categorized as “highly vulnerable”. Similarly, a high percentage of blue virtual water imported into the EU related to the other key products comes from areas under significant or severe water scarcity: pistachios (87%); grapes (74%); rice (70%); cotton (70%); and sugar cane (56%).

The results presented in this report form the baseline for the next phase of the project. This will focus how each economic sector in Europe may be affected by these dependencies and how their vulnerabilities are expected to change under climate change and subsequent weather extremes. The next step in this assessment will be to first understand how Europe's water demand will vary under different climatic conditions. The second step will be to analyse the impacts of climate change on water resources in regions from which EU imports water intensive products. Finally, the impacts that different economic sectors in Europe may face due to dependencies on virtual water imports under climate change and hydrological extremes will be elaborated. The results will help governments, European policy-makers at all levels and companies in their mid and long-term planning for sustainable development in light of climate change, population growth and increased demand for products and services.

1 Introduction

Water, like energy, is a key input into any economy. With variations in water availability and quality from country to country, water is a local issue. At the same time, because of international trade in goods to meet the needs of the world's populations, water is increasingly becoming a global resource and, thus, a global issue. International trade in commodities implies long-distance transfers of water in virtual form, where “virtual” water is understood to be the volume of water that has been used to produce a commodity and that is thus virtually embedded in it. Knowledge about the virtual water flows entering and leaving a region can cast a new light on the meaning of water dependencies of a region's economy and its susceptibilities outside its borders.

The impact of hydrological extremes, for instance droughts, can affect economic activities and ecological systems that depend on the availability of water. For example, lack of water can often result in losses in yields in both crop and livestock production. Production losses combined with change in demand for products and water by different economic sectors may lead to local shortages of certain goods, and thus result in the need for importing these goods from other regions. However, availability of these imports, particularly those that rely on water, can be at risk considering that production of many commodities is potentially sensitive to local hydrological extremes and global climate change.

Europe currently meets some of its water needs by importing “virtual” water in the form of goods and services from other countries and regions. Previous studies showed that this external component accounts for approximately 40% of Europe's water footprint for the period 1996-2005 (Hoekstra and Mekonnen, 2012). Reliance on food, energy and goods, which require water in their production from regions outside of Europe that are themselves vulnerable to hydrological extremes and climate change, may impose water related risks to different economic sectors in Europe. For example, the IPCC's 4th Assessment Report (IPCC, 2007) suggests that the Mediterranean Basin, Southern Africa, the western USA and southern and eastern Australia will suffer a decrease in water resources with a consequential reduction in production as a result of an increase in droughts. This forecast indicates that the structure of production within Europe and its imports may need to be adjusted to respond to climate changes that affect the availability of water resources around the world. Changes in the locality of production may have a number of subsequent environmental and social effects both in Europe and around the world. Imprex addresses this dependence of the European economy upon external water resources and assesses its related vulnerabilities under Work Package (WP) 12, which specifically aims at understanding and assessing the vulnerability of the European economy on the global supply and production of goods under hydrological extremes (drought and flood damage) and climate change with the following specific objectives:

- mapping current dependencies of economic sectors in Europe on water resources of Europe and of other parts of the world;
- assessing impacts of climate change and hydrological extremes on water resources of the regions that Europe's economy depends on;
- assessment of vulnerability of European economy on global supply and production of goods under hydrological extremes and climate change.



WP12 has been jointly implemented by Water Footprint Network (WFN) and PIK (Postdam Institute for Climate Impact research). WFN's work focuses on assessing dependencies of the European economy on external water resources by looking at virtual water flows entering the EU, together with elaboration of impacts of droughts and climate change on global water resources and an assessment of the effects of these impacts to supplies of goods to Europe. The direct and indirect impacts on different economic sectors in Europe related to floods at regional and global scales are addressed by PIK. WP12 will use the outputs of climate change scenarios from different WPs of Imprex as an input to the assessment.

The water footprint is an indicator of humanity's appropriation of fresh water in terms of volumes of water consumed and/or polluted. It can be measured for a single process such as growing cotton, for a product such as a pair of jeans, for a producer such as a textile wet processing factory, or for an entire multi-national company. It can also be calculated for a geographic region such as the EU. The water footprint of a geographic area, e.g. the EU, shows the total volume of water consumed and polluted in the area by industry, domestic water use and by agriculture. The water footprint of a product, such as a cotton t-shirt, is the volume of fresh water used to produce the product, measured over the full supply chain.

The water footprint can be regarded as a comprehensive indicator of freshwater resources appropriation, next to the traditional indicator of water withdrawal. It is a multi-dimensional indicator, showing water consumption volumes by source and polluted volumes by type of pollution; all components of the water footprint are specified geographically and temporally (Hoekstra *et al.*, 2011).

The water footprint has three components (Figure 1.1):

- **Green water footprint** is water from precipitation that is stored in the root zone of the soil and evaporated, transpired or incorporated by plants. It is particularly relevant for agricultural, horticultural and forestry products.
- **Blue water footprint** is water that has been sourced from surface or groundwater resources and is either evaporated, incorporated into a product or taken from one source and returned to a different source, or returned at a different time. Irrigated agriculture, industry and domestic water use can each have a blue water footprint. It shows consumptive use of water.
- **Grey water footprint** is an indicator for pollution and is defined as the volume of freshwater that is required to assimilate the load of pollutants to meet existing ambient water quality standards.

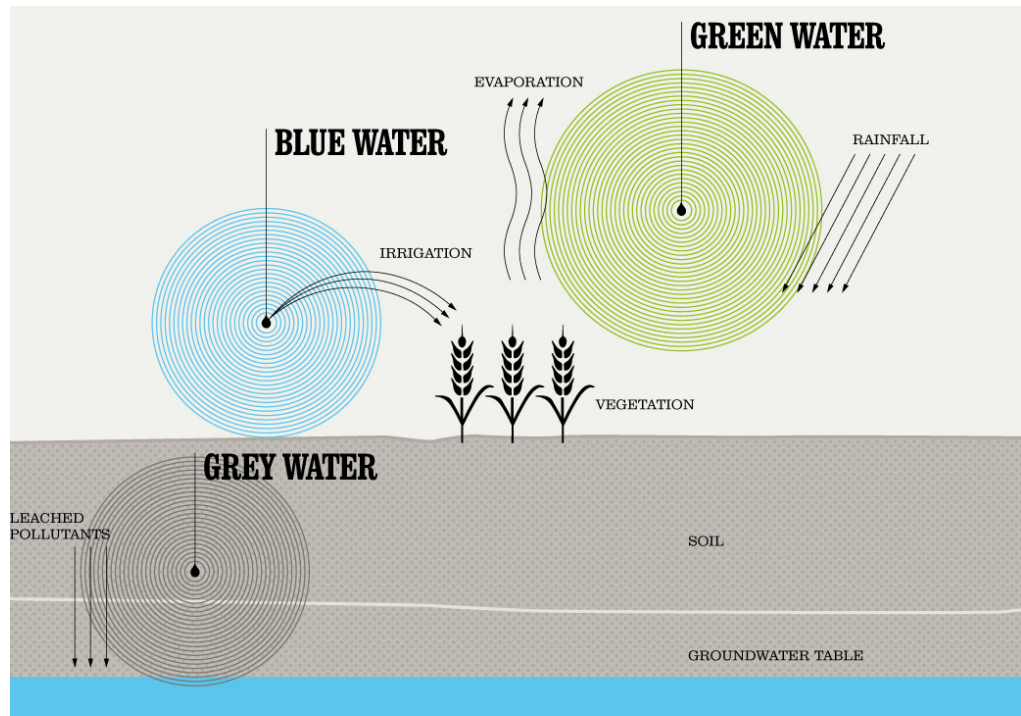


Figure 1.1. Components of agricultural water footprint: green, blue and grey (from SAB Miller and WWF, 2009)

This report presents the results of the first task of WP12, which aims to map current dependencies of economic sectors in Europe on the water resources of Europe and on other parts of the world. This will be used as the baseline case for analysis of future vulnerabilities of Europe's imports under climate change and hydrological extremes (drought), which will form the next stages of the project.

To map the current dependencies, first the water footprint of production and consumption in Europe per economic sector (agriculture, industry and domestic water use) is established for the period of 2006-2013. The water footprint of production in the EU is the volume of water used to produce goods and services from local water resources within the geographical boundaries of EU28 countries. The water footprint of consumption of the EU is the volume of water used to produce all the goods and services that are consumed by the people living in the EU, irrespective of the origin of goods and services. Depending upon the location where water is used to produce these goods and services, the water footprint of consumption can either be partly inside the region (consumption of local products) and/ or partly in other countries outside the EU 28 (consumption of imported products). This analysis enables the water dependencies of Europe's economy on water resources outside Europe to be mapped i.e., the volumes of water consumed in other parts of the world to produce goods imported into Europe. It also makes it possible to identify which imported products are key to the EU and where they are produced. Having mapped the key products and their origin of production, water scarcity and drought in the producing regions are elaborated in order to understand the vulnerability levels related to the production of key imported products.



This report is structured as follows:

- State of the art of the method and framework applied (chapter 2);
- Method and data (chapter 3);
- Results including the baseline conditions of water footprint of production, consumption, virtual water imports; external water dependencies of European economy, key imported products and their production regions (chapter 4);
- Vulnerability assessment of key imported products to water scarcity and drought (chapter 5);
- Discussion of key assumptions and limitations (chapter 6); and
- Next steps describing the outline of tasks for the remainder of the project (chapter 7).

2 State of the art

2.1 Virtual water and national water footprint accounting

The first assessments of the water footprint of nations were presented by Hoekstra and Hung (2002). They added the net virtual import of selected crop products to the total volume of blue water withdrawal in agriculture, domestic and industrial sectors in a country to calculate the total water footprint of a nation. This first study on water footprint neither took into account the international trade of livestock and livestock products nor the volume of green water used in national crop production, a major shortcoming later rectified by Chapagain and Hoekstra (2004). The water footprint studies following the first publications (Chapagain and Hoekstra 2003, 2004, Hoekstra and Hung 2005, Chapagain and Orr 2008), lacked incorporation of local growing conditions. The country average climate data they used to calculate the water evaporated in the production of goods and services was too coarse for countries where spatial variations in climate and crop parameters are large, such as the USA, China or India. They also assumed that in all cases the potential crop evaporation was fully met, meaning that deficit crop water requirements were always fulfilled by supplementary irrigation. Therefore, these early studies overestimated the water footprint of crops and livestock products.

The grey water footprint component was later added to the water footprint accounting studies as an attempt to calculate the degree of pollution occurring in the production process from residual fertilisers and pesticides in the return flows from agricultural fields, or from various contaminants in an industrial effluent (Chapagain 2006, Hoekstra and Chapagain 2008). This method of water footprint accounting was further extended by Chapagain and Orr (2009), by including a covered system with seasonal climatic variability in production. A more recent study by Mekonnen and Hoekstra (2010a, 2010b) updated the water footprint accounts of nations by using finer (5 by 5 arc minutes) resolution data, rather than using country average data. They used crop specific irrigation data to address the issue of overestimation of crop water use in earlier estimates.

There is a wide range of publications available on water footprint accounting at product level (sector or brand), regional level and national level and an increasing focus on river basin levels, such as Lower Fraser Valley and Okanagan basins in Canada (Brown *et al.* 2009), and the Guadiana river basin in Spain (Aldaya and Llamas 2008). A coherent framework of water footprint accounting has recently been compiled in a manual by Water Footprint Network (Hoekstra *et al.* 2011).

In theory, there are two broad approaches to calculating the water footprint of a nation or a region: the bottom-up approach and the top-down approach.



2.1.1 Bottom-up approach of national water footprint accounting

There are two variants of the bottom-up approach in calculating the water footprint of national consumption:

- Variant 1: Using the consumption volume of individual inhabitants in the country and multiplying that with the water footprint of the product or services consumed in a country. An example of this is presented by (Mekonnen and Hoekstra 2011b), and is used widely in the water footprint of national consumption database 1996-2005 (Mekonnen and Hoekstra 2011b).
- Variant 2: Using the national water budget, which is calculated using the water footprint of individual products produced in a country and adding that to the virtual water imported per category or type of product and subtracting the virtual water export related to the export of products from a country. Examples of this are: (Chapagain and Hoekstra 2004, Chapagain and Orr 2008). In the Water Footprint Assessment Manual (Hoekstra *et al.* 2011), this variant is defined differently (top-down) than in the current study.

The difference between these two variants lies mainly in the quality of data used, because different national accounts of production, trade and consumption are often not compatible. This is reflected in the end results.

2.1.2 Top-down approaches of national water footprint accounting

The top-down approaches are mainly used for large groups of consumers, such as a nation or region. This is done by aggregating water use within economic sectors of a country, via inter-sectorial processes and transactions, and adding water that 'flows in' through imports and subtracting water that 'flows out' through exports (Feng *et al.* 2011b, Chenoweth *et al.* 2014). Water use or water withdrawal data is normally obtained from national and industrial databases. This approach allows for an approximation of water use in large supply chains; however, water consumption for individual products at a regional level is not feasible because calculations for individual products are done interdependently as opposed to the independent calculations that are made for each product in a bottom-up approach (Feng *et al.* 2011c). Life Cycle Assessment (LCA), input-output analysis (IOA) and water inventories are examples of this approach.

A common top-down approach is an IOA. The IOA approach is an economic model that has been used since the 1960s (Feng *et al.* 2011c). It focuses on economic sectors and interdependencies to estimate direct and indirect water use that is embedded within consumption of a whole economy (Velázquez 2006, Zhao *et al.* 2009, Ercin *et al.* 2013). More recently Multi-Regional Input Output Analysis (MRIO) is used to account for water use across different regions that participate in trade flows (Feng and Hubacek 2015).

In the top-down approach, the total global virtual water flows are calculated per sector using the framework of environmental input-output analysis. It is based on final consumption, and water used in production is assigned to the end-product consumers. The major drawback of this approach is that it aggregates the results at the level of economic sectors rather than individual products. As agriculture is the single most significant water user in the world, aggregation in this sector is a major shortcoming of the approach. A number of studies have used input-output tables to allocate the total national water footprint of different economic sectors in a country (Velázquez, 2006; Dietzenbacher and Velaacuteczquezb, 2007; Guan and Hubacek, 2007; Zhao *et al.*, 2009; Feng *et al.*, 2011).

Even though these approaches are suitable for national, sectoral or industrial water footprint accounting, they do not provide detailed insight into primary products (crops, forestry, and livestock), industrial products or localised impact assessments due to aggregation. To address this, other methodologies are being developed, such as an integrated MRIO-Footprint (MRIO-F) (Ewing *et al.* 2012). This model incorporates detailed data of the water footprint as it integrates other footprints.

The other common top-down approach is an LCA. LCA originated in industrial ecology and is used to assess environmental impacts and resource use along the life cycle of a product or service. LCA uses databases (e.g. Econinvent (Pfister *et al.* 2015), Gabi Databases (ThinkStep), SimaPro (SimaPro UK)) and water input flows and output flows inventories (Jeswani and Azapagic 2011). However, many of these databases are not site specific, are incomplete or not frequently updated (Jefferies *et al.* 2012, Herath *et al.* 2013). In many cases of industrial water use, databases usually provide total water withdrawal per company or sector but do not specify consumptive use or process water use. For example, an LCA for the UK beverage sector carried out by Amineyo (2012) focuses primarily on a set of different midpoint environmental impacts. Midpoints are the links in the cause-effect chain of an impact category in an environmental mechanism, prior to the endpoints, such as ozone depletion potentials, global warming potentials, etc. Water consumption is assessed through the water demand indicator but does not consider the different types of water as proposed by WFN.

Grey water footprint in LCA is assessed through potential impacts on freshwater using midpoint level indicators (e.g. eutrophication, acidification, eco-toxicity) or endpoint level indicators (e.g. human health and ecosystem quality (Boulay *et al.* 2015)). Midpoint level indicators are generally more useful for scientific research and academia while endpoint, damage-oriented indicators are more useful for the general public and consumers (Finnveden *et al.* 2009). Furthermore, the LCA approach tends to be more impact-oriented rather than volume-oriented and may require elaborate calculations, intensive data collection and modelling (Feng *et al.* 2011b, Jefferies *et al.* 2012). A comparison of top-down and bottom-up approaches is presented by Feng *et al.* (2011a).



Table 2.1. Key water footprint accounting publications at different spatial scales

Spatial scale	Key publications
Global coverage (nations)	Water footprint of nations (Chapagain and Hoekstra 2004, Hoekstra and Chapagain 2007, Hoekstra and Mekonnen 2012)
Regions	Shanghai (Chen <i>et al.</i> 2013); European water footprint scenario (Ercin and Hoekstra 2016); EU (Vanham 2013) etc.
Individual countries	Netherlands (Hoekstra and Chapagain 2005, Van Oel <i>et al.</i> 2008), France (Ercin <i>et al.</i> 2013), China (Zhao <i>et al.</i> 2009, Ge <i>et al.</i> 2011, Zhuo 2016, Zhuo <i>et al.</i> 2016), UK (Chapagain and Orr 2008, Feng <i>et al.</i> 2011c, Hoekstra and Mekonnen 2016), Italy, Morocco (Schyns and Hoekstra 2014), Tunisia (Chouchane <i>et al.</i> 2015), Germany (Sonnenberg <i>et al.</i> 2009), Switzerland (Gnehm 2012), Mexico (AgroDer 2012) etc.
City	Beijing (Huang <i>et al.</i> 2015, Ma <i>et al.</i> 2015, Shi <i>et al.</i> 2015, Yang <i>et al.</i> 2015, Sun <i>et al.</i> 2016); European cities (Scipioni <i>et al.</i> 2015, Vanham <i>et al.</i> 2016); Cities in Latin America (FLLA and SASA 2015).

3 Method and data

Firstly, this report focuses on analysing the water footprint of production and consumption of the EU, including virtual water imports to the EU28 countries. Secondly, it identifies the key products and regions upon which the European economy depends and assesses their vulnerability to drought and water scarcity. The current study covers the period 2006-2013 for the EU28 countries. Special territories of the member states, such as British and Dutch dependent territories, have not been included as part of the EU, as they are reported separately in FAO and ITC data (Figure 3.1).

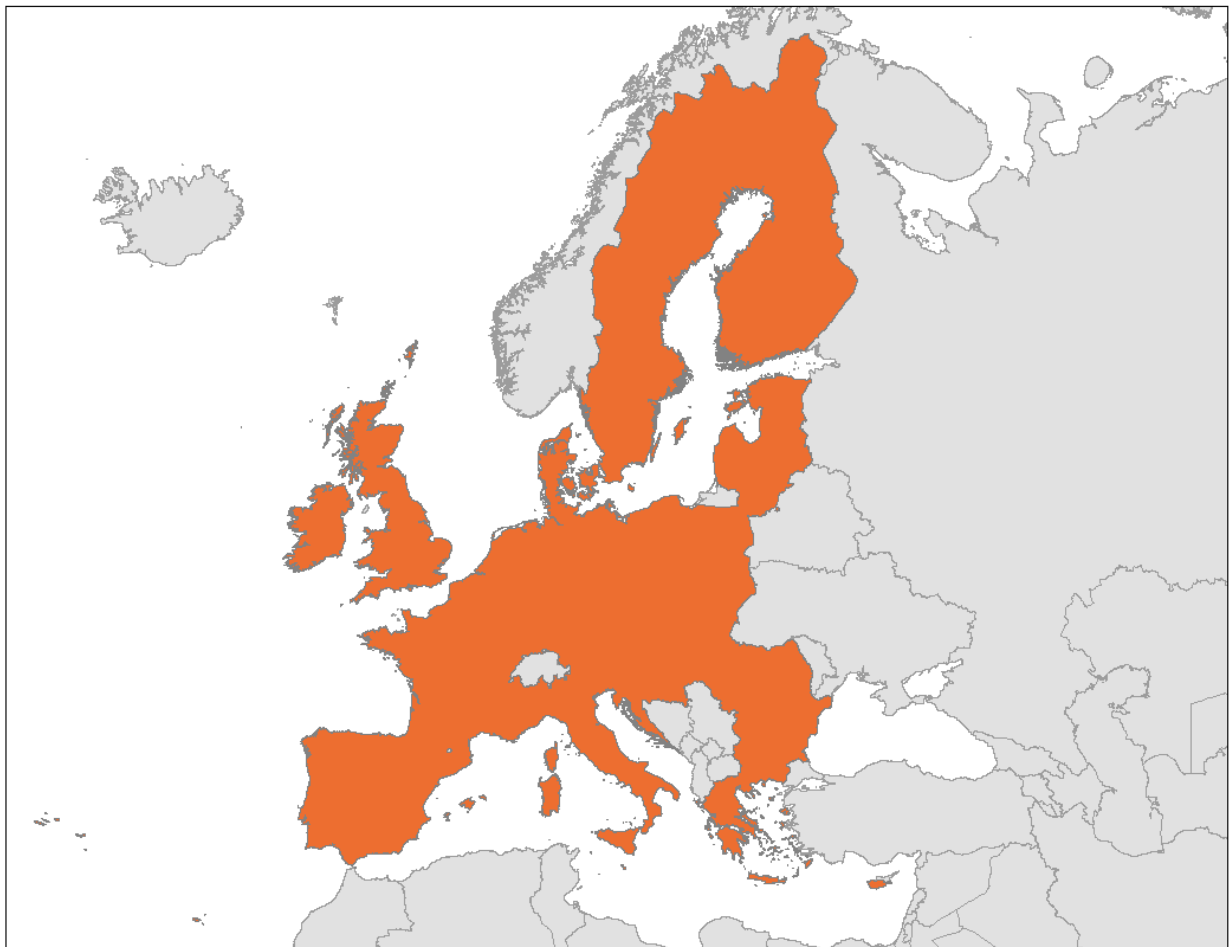


Figure 3.1. Map of EU28 territories considered in the study



3.1 Water footprint of a product

3.1.1 Water footprint of primary crops

The water footprints of the primary crops was calculated by multiplying average water footprints for crops based on the period 1996-2005 (Mekonnen and Hoekstra 2010b¹) with a specific scaling factor per crop.

$$WF_{cr,c,y} = WF_{cr,c,avg1995-2005} * f_{s,cr,c,y} \quad \text{Equation 1}$$

where $WF_{cr,c,y}$ [m³/tonne] is the water footprint of crop cr , in country c , in year y ; $WF_{cr,c,avg1995-2005}$ [m³/tonne] is the average annual water footprint of crop cr , in country c for the period of 1996 to 2005 (taken from the study of Mekonnen and Hoekstra 2010b), $f_{s,cr,c,y}$ is the scaling factor for crop cr in year y in country c .

The scaling factor per crop, $f_{s,cr,c,y}$, was calculated based on the change in production per unit of land per crop per country for the current study period compared to the production in the period used in the study by Mekonnen and Hoekstra (2010b).

$$f_{s,c,e,y} = \frac{Yield_{cr,c,avg1996-2005}}{Yield_{cr,c,y}} \quad \text{Equation 2}$$

where $Yield_{c,e,y}$ [tonne/hectare] is the yield of crop cr in the country c in year y , and $Yield_{cr,c,avg. 1996-2005}$ [tonne/hectare] is the average yield of crop cr in the country c averaged over the period of 1996-2005. The crop yields were taken from FAO (FAOSTAT data 2016a).

Equation 1 was applied to assess all three components of the water footprint (green, blue, and grey water footprint) of 146 primary crops separately per country per year.

3.1.2 Water footprint of live animals

The methodology to calculate the water footprint of live animals is based on Mekonnen and Hoekstra (2010c) and distinguishes between green, blue and grey water footprint components. The water footprint of live animals is composed of three parts: the water footprint of drinking; the water footprint for servicing and feed preparation; and the water footprint of feed consumed by animals (Equation 4). The water footprint of a live animal related to feed consumption is an indirect part, whereas the first two are direct components (drinking and servicing) of the water footprint of livestock production. It was calculated for three production systems of animals (grazing, mixed and industrial) and for five animal types (cattle, swine, sheep, goats and chickens) for livestock products such as meat and leather etc., and two animal types; dairy cow (milk and related products) and laying hens (for eggs).

As a first step, the water footprint of a live animal in year y per country was calculated.

¹ Short summary of studies done by Mekonnen and Hoekstra on which methodology is based is presented in Appendix M.

$$WF_{animal_{c,y,s,t}} = PS_{c,y,s,t} \times (WF_{feed_{c,y,s,t}} + WF_{drinking_{c,y,s,t}} + WF_{service_{c,y,s,t}}) \times \frac{ALW_t}{ALS_t}$$

Equation 3

where $WF_{animal_{c,y,s,t}}$ is the water footprint of animal t [m^3 /animal/year] in country c , year y , $WF_{feed_{c,y,s,t}}$ is the water footprint related to feed consumption [m^3 per tonne of live animal weight], $WF_{drinking_{c,y,s,t}}$ is the drinking water consumed by the animal [m^3 per tonne of live animal weight], $WF_{service_{c,y,s,t}}$ is the water consumed in the animal husbandry activities [m^3 per tonne of live animal weight], and $PS_{c,y,s,t}$ is the relative share of the production system s (grazing, mixed or industrial) per country c and animal type t . The relative share of animal production from different production systems per country was calculated using the data on the water footprint of livestock production per system from Mekonnen and Hoekstra (2010c), and was considered constant for the study period. The values of $WF_{drinking_{s,t}}$ and $WF_{service_{s,t}}$ per animal type and production system were obtained from Mekonnen and Hoekstra (2010c). ALW_t is the animal live weight (mass/animal) per animal type t , ALS_t is the productive animal life span (years) per animal type t . The data on animal live weight and animal life span was obtained from various sources, a comprehensive table of these data sources is available in Mekonnen and Hoekstra (2010c).

The major component in livestock's water footprint is related to the feed consumption which was calculated as the summation of the water footprint of feed concentrate ($WF_{conc.}$) and fodder (WF_{fodder}):

$$WF_{feed_{c,y,s,t}} = (WF_{conc_{c,y,s,t}} + WF_{fodder_{c,y,s,t}}) \times CW_t$$

Equation 4

in which CW_t is the weight of the livestock output expressed as the fraction of live weight (weight of livestock output / weight of live animal) per animal type t .

The water footprint of fodder $WF_{fodder_{c,y,s,t}}$ was calculated using Equation 8. The water footprint of feed concentrate $WF_{conc_{c,y,s,t}}$, expressed in m^3 /tonne of live animal or total output, in country c , year y , production system s and animal type t , was calculated as:

$$WF_{conc_{c,y,s,t}} = \sum_{cr=1}^C (W_{conc_{c,y,s,t,cr}} \times WF_{conc_{c,y,cr}}^*)$$

$$= \sum_{cr=1}^C \left(f_{conc_{c,s,t}} \times \frac{1}{AFCE_{s,t}} \times WF_{conc_{c,y,cr}}^* \right)$$

Equation 5

in which $WF_{conc_{c,y,s,t}}$ is the water footprint of feed concentrate [m^3 /tonne of animal output] in country c , year y , production system s and animal type t , $AFCE_{s,t}$ is the animal feed conversion efficiency (mass live animal output/mass of feed) in production system s and animal type t ; $f_{conc_{c,s,t}}$ is the fraction of concentrate in feed (mass of concentrate/ mass of feed) in country c , for year y and animal type t ; $W_{conc_{c,y,s,t,cr}}$ is the weight of concentrate per feed crop [tonne] in country c , for year y , crop cr , production system s and animal type t , $WF_{conc_{c,y,cr}}^*$ is the water footprint of the feed crop cr included in the feed concentrate (m^3 /tonne of feed) as formulated in



Equation 6. The feed conversion efficiencies were obtained from Mekonnen and Hoekstra (2010c).

One of the main factors determining livestock's water footprint is the feed composition (weight and type of feed crop) which is adapted from Mekonnen and Hoekstra (2010c) and Wheeler *et al.*, (1981). It includes three basic categories of feed concentrate products: cereals, oil-meals and other concentrates. The composition of specific crops and crop products in the feed concentrate per country and year is based on data from FAO's Food Balance Sheets (FAOSTAT data 2016b).

The water footprint for each crop product, both in importing and exporting countries was weighed using the share of import and national production (tonne/year) to the total quantity of crop used as feed in the country (sum of crop imports and national production of crops used as feed expressed in tonne/year) as formulated in Equation 7. Share of national production and import per crop, country and year were obtained from the Food Balance Sheets from FAO (FAOSTAT data 2016b). The origin of imported feedstuff was taken from the "Virtual Water Trade" model developed in section 3.4.

$$WFconc_{c,y,cr}^* = \left(\sum_{e=1}^E \left(\frac{Import_{c,y,e,cr}}{(\sum_{e=1}^E Import_{c,y,e,cr}) + Production_{c,y,cr}} \times WF_{e,y,cr} \right) \right) + \left(\frac{Production_{c,y,cr}}{(\sum_{e=1}^E Import_{c,y,e,cr}) + Production_{c,y,cr}} \times WF_{c,y,cr} \right) \quad \text{Equation 6}$$

in which $Import_{c,y,e,cr}$ refers to the quantity of import (tonne/year) of the specific feed crop cr per importing country c from country e in year y , $Production_{c,y,cr}$ refers to the national production of the specific crop cr (tonne/year) per importing country c in year y , $WF_{c,y,cr}$ is the water footprint (m^3 /tonne) per crop in the importing country c , year y and crop cr , and $WF_{e,y,cr}$ is the water footprint (m^3 /tonne) per crop cr in the exporting country e [where E refers to the total number of exporting nations of that particular crop] in year y .

The water footprint of fodder $WFfodder_{c,y,s,t}$ is calculated as:

$$WFfodder_{c,y,s,t} = (AFCE_{s,t} \times (1 - fconc_{c,s,t}) \times WFfodder_{c,y}^*) \times CW_t \quad \text{Equation 7}$$

in which $fconc_{c,s,t}$ is the fraction of concentrate in feed (mass of concentrate/mass of feed); the factor $(1 - fconc_{c,s,t})$ indicates the fraction of fodder in the feed that is consumed by the animal and $WFfodder_{c,y}^*$ is the water footprint of fodder products (m^3 /tonne of product), and CW_t is the weight of the livestock output expressed as the fraction of live weight (weight of livestock output / weight of live animal) per animal type t .

Fodder can consist of several types of feed crops with low nutrient density and high content of fibre such as pastures, roughages or crop residues and by-products. In this study, all the fodder consumed by ruminant animals is assumed to be composed of pastures. The water footprint of pasture was taken from Mekonnen and Hoekstra (2010c) world average values. For monogastric animals (poultry and swine production), fodder crops is a mixture of several crops known as roughage. The water footprint of roughage was calculated by considering the average yield of the crops included in the roughage per year and country.

3.1.3 Water footprint of processed crop and livestock products

The water footprints of primary crops and live animals were used to calculate the water footprints of derived crop and livestock products, using the product fraction and the value fraction (Hoekstra *et al.* 2011):

$$WF_{cropproduct_{y,c}} = WF_{crop_{y,c,cr}} \times \frac{fv_{cr}}{fp_{cr}} \quad \text{Equation 8}$$

where $WF_{cropproduct_{y,c,t}}$ is the water footprint of the crop products originating from the primary crop cr , year y , country c , fp_{cr} is the product fraction of the crop cr taken from Mekonnen and Hoekstra (2010a). The value fraction for crop products fv_{cr} was calculated for the new period based on the total internationally traded monetary value of the products average for the period 2006-2013 using the trade statics from ITC (ITC 2010, 2016).

$$fv_p = \frac{price_p \times w_p}{\sum_{p=1}^P (price_p \times w_p)} \quad \text{Equation 9}$$

in which $price_p$ is the global average price of product p in the period (monetary unit/mass) and w_p is the weight of the product p taken from (Mekonnen and Hoekstra 2010a). The denominator is summed over the P output products ($p=1$ to P) that originate from the input product.

The water footprint of 107 processed livestock products used in the study were calculated using the product fraction and value fraction of these products derived from corresponding animal types.

Product and value fractions for animal products were obtained from Mekonnen and Hoekstra (2010c).

$$WFlvstPrd_{y,c,t} = WF_{animal_{y,c,t}} \times \frac{fv_p}{fp_p} \quad \text{Equation 10}$$

where $WFlvstPrd_{y,c,t}$ is the water footprint per livestock product in year y , country c and animal type t , $WF_{animal_{y,c,t}}$ is the water footprint per live animal [$m^3/\text{animal}/\text{year}$] in year y , country c and animal type t , fv_p is the value fraction for livestock product p and fp_p is the product fraction for livestock product p .

The blue, green and grey components of the water footprint of livestock products were calculated separately using related components of water footprint for crop and crop products used as feed, components of water footprint of drinking and servicing in the relevant equations 1-10 above.

3.2 National water footprint accounting framework

National water footprint accounting was conducted using a stepwise modular approach, as described in the Water Footprint Assessment Manual (Hoekstra *et al.* 2011). The national water footprint accounting scheme (Figure 3.2), as described in the manual, is used to explain the methods for each step in the following section.



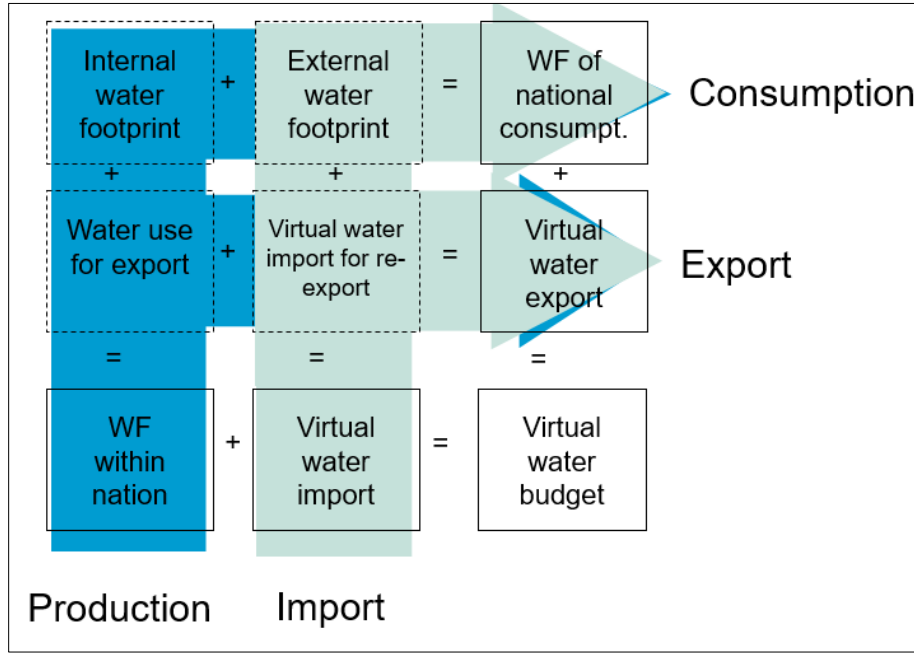


Figure 3.2. Various components of national water footprint accounting schemes

Firstly, the virtual water flows and water footprints within nations was calculated for all countries in the world. For the accounting of EU28 countries as a region, the virtual water import and export was calculated only to and from countries external to the EU i.e. the rest of the world.

3.3 Water footprint of national production

The water footprint of national production, also known as the water footprint within a nation ($WF_{prod\ c,y}$ volume/time), is defined as the total freshwater volume consumed or polluted within the territory of the nation.

It can be calculated following the method described in the Water Footprint Assessment Manual (Hoekstra *et al.* 2011):

$$WF_{prod\ c,y} = WF_{prod\ industry,y,c} + WF_{prod\ crop,c,y} + WF_{prod\ livestock,c,y} + WF_{prod\ domestic,c,y} \quad \text{Equation 11}$$

where $WF_{prod\ c,y}$ refers to the water footprint of production in country c in year y , $WF_{prod\ industry\ y,c}$ is the water footprint of industrial production in country c in year y , $WF_{prod\ crop\ y,c}$ is the water footprint of crop production in country c in year y , $WF_{prod\ livestock\ y,c}$ is the water footprint of livestock production in country c in year y , $WF_{prod\ domestic\ y,c}$ is the water footprint of domestic water use in country c in year y .

3.3.1 Water footprint of crop production

The national water footprint of crop production $WF_{prod\ crop,c,y}$, per country c , per year y , was calculated by multiplying the crop production volume $P_{cr,c,y}$ [tonne/year] per primary crop cr by the average water footprint of the crop per country $WF_{cr,c,y}$ [m^3/y], and is expressed as:

$$WF_{prod\ crop,c,y} = \sum_{c=1}^c (WF_{cr,c,y} \times P_{cr,c,y}) \quad \text{Equation 12}$$

The data on crop production $P_{cr,c,y}$ [tonne/year] was obtained from FAO (FAOSTAT data 2016a).

3.3.2 Water footprint of livestock production

The total water footprint of livestock sector, $WF_{prod\ livestock,c,y}$, per country c , year y , is calculated by multiplying the annual water footprint per animal ($m^3/y/animal$) by the total animal number.

$$WF_{prod\ livestock,c,y} = \sum_{t=1}^7 \left[\left\{ \sum_{s=1}^3 (WF_{livestockProduction_{c,y,s,t}} \times PS_{c,s,t}) \right\} \times N_{Animals_{c,y,t}} \right] \quad \text{Equation 13}$$

where $WF_{livestockProduction_{c,y,s,t}}$ is the production water footprint of livestock sector per year y and animal type t , per production system s in country c [Equation 14], $N_{Animals_{c,y,t}}$ is the number of animals per country c , year y , and animal type t .

Animal numbers per country and year, $N_{Animals_{c,y,t}}$, were obtained from FAO (FAOSTAT data 2016a). In the case of cattle and chicken production, the number of milk cows and layers [poultry] is subtracted from total cattle and poultry numbers.

Crop products used as feed concentrate are included in the national water footprint of crop production. Therefore, in order to avoid double-counting, they were excluded from the accounting of the water footprint of the livestock sector.

$$WF_{animalproduction_{c,y,s,t}} = (WF_{fodder_{c,s,t}} + WF_{drinking_{s,t}} + WF_{service_{s,t}}) \times ALW_t / ALS_t \quad \text{Equation 14}$$

where $WF_{drinking_{s,t}}$ is the water consumed by the animals as drinking in production system s and animal type t , $WF_{service_{s,t}}$ is the water consumed in the animal husbandry activities in production system s and animal type t . ALW_t is the animal live weight (mass/animal) per animal type t , ALS_t is the animal life span (years) per animal type t .

3.3.3 Water footprint of industrial production

The national water footprint of industrial production within the area of a nation was updated from the average for the period of 1996-2005 from Mekonnen and Hoekstra (2011b) using a scaling factor calculated based on the most recent water withdrawal data for the industrial sector (FAO 2016) and the average industrial water withdrawal from Mekonnen and Hoekstra (2011b). For the



year in which the water withdrawal data is not available, a linear extrapolation was made, based on data available for any other sets of years for the country.

$$WFI_{c,y} = WFI_{c,avg1995-2005} * \frac{WI_{c,y}}{WI_{c,avg1996-2005}} \quad \text{Equation 15}$$

where $WFI_{c,y}$ [Mm³/y] is the total water footprint of the industrial sector per country c and year y , $WFI_{c,avg1996-2005}$ [Mm³/y] is the average annual industrial water footprint for the period 1996-2005 obtained from Mekonnen and Hoekstra (2011b), $WI_{c,avg1996-2005}$ is the average industrial water withdrawal for the period 1996-2005 (Mekonnen and Hoekstra 2011b), and $WI_{c,y}$ is the industrial water withdrawal for the year y in country c .

Using the industrial value added $VAI_{c,y}$ [US\$/y] in country c (World Bank 2016), the water footprint per unit of value added $WFI_{c,y}$ [m³/US\$] was calculated per country, in line with Chapagain and Hoekstra (2004):

$$WFI_{c,y} = \frac{WI_{c,y}}{VAI_{c,y}} \quad \text{Equation 16}$$

3.3.4 Water footprint of domestic water supply

The national account of the water footprint of domestic water supply was updated using the change in population from the average for the baseline years calculated by Mekonnen and Hoekstra (Mekonnen and Hoekstra 2011b). This approach inherently assumes that the per capita water footprint of the domestic water sector remains constant over time. The population data was obtained from FAOSTAT (2016c).

$$WFdom_{c,y} = WFdom_{c,avg1996-2005} * \frac{Pop_{c,y}}{Pop_{c,avg1996-2005}} \quad \text{Equation 17}$$

where $WFdom_{c,y}$ [Mm³/y] is the water footprint of the domestic sector in country c and year y , $Pop_{c,y}$ is the total population per country c , $Pop_{c,avg1996-2005}$ is the average population for the period 1996-2005 for the period, $WFdom_{c,avg1996-2005}$ is the average domestic water footprint for the period 1996-2005 (Mekonnen and Hoekstra 2011b) for country c .

3.4 Virtual water import

International virtual water imports were calculated by multiplying commodity trade flows by their associated water footprint [m³/t or m³/US\$];

$$VWI_{c,p,y} = \sum_{e=1}^E T_{c,p,y,e} \times WF_{e,p,y} \quad \text{Equation 18}$$

where $VWI_{c,p,y}$ [Mm³/y] is the virtual water import by a country c related to the import of product p from exporting country e in year y , $T_{c,p,y,i}$ is the physical quantity of the product imported [tonne/year] or monetary value [US\$/year] of the imported product [in the case of industrial

products] by a country c from country e in year y , and $WF_{e,p,y}$ is the water footprint [m^3 /tonne or m^3 /US\$] of the imported products in the exporting country e in year y . The international trade data for the period 2006-2013 was obtained from the ITC trade database (ITC 2010, 2016).

The virtual water import per nation was calculated for 860 crop products traded internationally during the period 2006-2013, which is substantially higher than the number of crop products covered in the earlier study (311) by Mekonnen and Hoekstra (2010c). The difference is mainly due to the inclusion of a wide range of cotton textiles in the new calculation. The virtual water import per nation related to the import of livestock product was calculated for 126 livestock products traded internationally during the period 2006-2013, compared to 106 livestock products in the study by Mekonnen and Hoekstra (2010c). Most of the additional livestock products were not reported in the earlier ITC database used in the previous studies. The virtual water import per nation related to the import of industrial products was calculated for 23 major industrial product categories, following the earlier list of products from Mekonnen and Hoekstra (2010c), and is listed in Appendix H for the period 2006-2013.

It is to be noted that the product nomenclature system used in the earlier study is SITC, whereas the current study uses the ITC trade database using the HS system. Hence, the comparison on the number of products covered in these two studies is merely an indication of the scope of the product types covered.

The import of virtual water by EU28 countries was calculated as external to the EU. Hence, the internal EU trade flows were not included in the total virtual water import estimation. The calculation was made for each component of the water footprint [green, blue and grey] separately for each crop, livestock and industrial product, using Equation 18.

3.5 Virtual water budget of the EU

The virtual water budget, $VWB_{EU,y}$ [m^3/y] of the EU was calculated as the sum of two components [Equation 20, Figure 4], water footprint of production in the EU, $WF_{productionEU,y}$, and virtual water import by the EU ($VWI_{eu,y}$), as presented in Equation 19.

$$VWB_{EU,y} = WF_{productionEU,y} + VWI_{eu,y} \quad \text{Equation 19}$$

where $WF_{productionEU,y}$ is the water footprint of the EU was based on the national production of the 28 EU member countries, and was calculated as:

$$WF_{productionEU,y} = \sum_{c=1}^{28} (WF_{production c,y}) \quad \text{Equation 20}$$

The virtual water import by the EU, $VWI_{eu,y}$, was calculated equal to the sum of virtual water import by individual EU28 countries from all the countries outside the EU region, $non.eu$, in year y , expressed as:

$$VWI_{eu,y} = \sum_{c=1}^{eu28} (\sum_{e=1}^{non.eu} T_{c,p,y,e} \times WF_{e,p,y}) \quad \text{Equation 21}$$



In other words, this implies that intra-EU virtual water flows are excluded from the total EU virtual water imports (Figure 3.3).

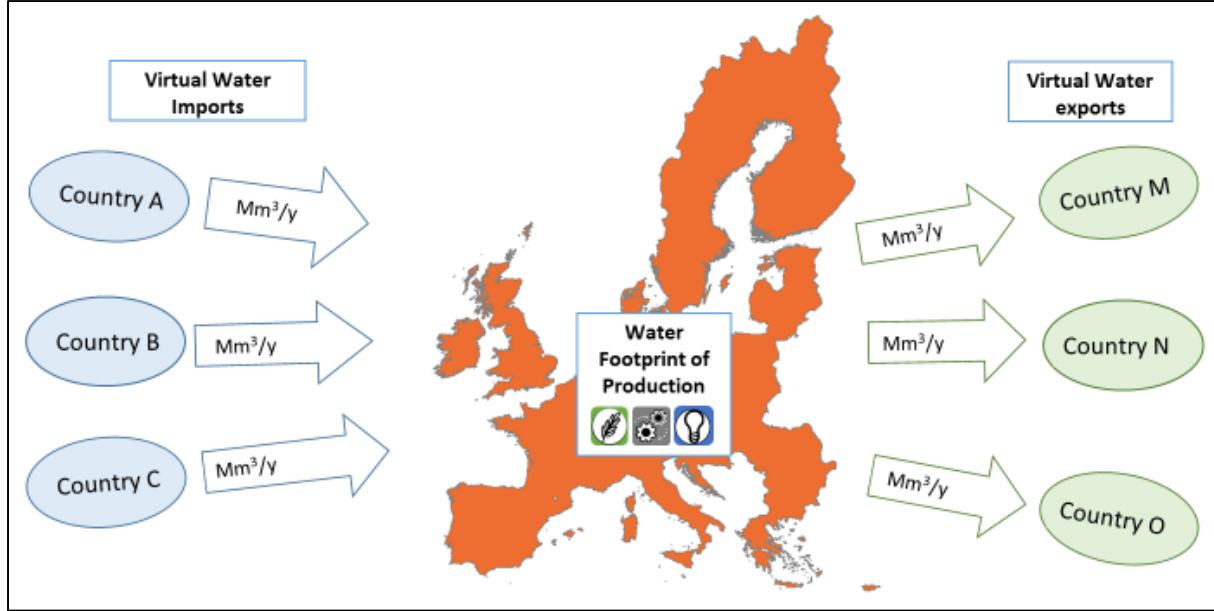


Figure 3.3. Schematic of the virtual water budget of the EU

3.6 Water footprint of consumption

The water footprint of consumption of the EU ($WF_{cons,EU,y}$, Mm^3/y) was calculated by subtracting the total virtual water exports from EU28 countries to countries outside the EU ($VWE_{eu,y}$), from the total virtual water budget of the EU, $VWB_{i,y}$.

$$WF_{cons,EU,y} = VWB_{EU,y} - VWE_{eu,y} \quad \text{Equation 22}$$

where $VWE_{eu,y}$ is calculated as the sum of the import of virtual water by non-EU [countries outside EU28 region] from EU28 countries.

$$VWE_{eu,y} = \sum_{c=1}^{non.eu} \left(\sum_{e=1}^{eu} T_{c,p,y,e} \times WF_{e,p,y} \right) \quad \text{Equation 23}$$

The water footprint of European consumption, $WF_{cons,EU,y}$, has two components, based on whether the water used in the production of goods and services consumed by the inhabitants of EU28 countries is from within the European boundaries or from external sources in the form of imported products. The external water footprint of European consumption is defined as the part of the total virtual water imported by the EU, $VWI_{EU,y}$, in year y that is consumed in the EU. It was calculated as the share of the water footprint of consumption in proportion to the share of virtual water import to the virtual water budget of the EU.

If the ratio of import to the virtual water budget is 1, the external water footprint of the EU is equal to the water footprint of consumption. This implies that the internal component of water footprint of consumption is zero. Similarly, if the virtual water import is zero, the external component of water footprint of consumption is zero, which can be calculated by using equation 24:

$$EWF_{EU,y} = WF_{con,EU,y} \times \frac{VWI_{eu,y}}{VWB_{eu,y}} \quad \text{Equation 24}$$

The internal water footprint of European consumption, $IWF_{eu,y}$ is defined as the consumption of water intensive goods and services produced using domestic water sources. It was calculated as the share of the water footprint of consumption allocated in ratio of water footprint of production, $WF_{production,eu,y}$, to the virtual water budget of EU, $VWB_{eu,y}$. If the ratio is 1, the internal water footprint of the EU is equal to the water footprint of consumption implying that there is no external water footprint of consumption. Similarly, if the water footprint of production is zero, the internal component of water footprint of consumption is zero, which can be calculated by using equation 25:

$$IWF_{EU,y} = WF_{con,EU,y} \times \frac{WF_{production,eu,y}}{VWB_{eu,y}} \quad \text{Equation 25}$$

3.7 Dependencies of the European economy on water resources and its vulnerability

3.7.1 Virtual water import dependencies

The dependency of the European economy on the other parts of the world in terms of water resources for a particular commodity c (Dep_c) – the so called ‘product dependency ratio’ (Hoekstra and Chapagain 2006) – is defined as the ratio of annual average virtual water import volume related to commodity c (VWI_c) to the sum of virtual water import (VWI_c) and water footprint of production within the EU for that particular commodity (WFP_c):

$$Dep_c = \frac{VWI_c}{VWI_c + WFP_c} \quad \text{Equation 26}$$

Dependencies are categorized as follows:

- $Dep_c < 0.25$, “low dependency”
- $0.25 < Dep_c < 0.5$, “moderate dependency”
- $0.5 < Dep_c < 0.75$, “high dependency”
- $0.75 < Dep_c < 1$, “very high dependency”
- $Dep_c = 1$, “absolute dependency”



3.7.2 Key imported products

Key imported products were selected based on their ranking relative to the main virtual water flows into the EU. Crops were ranked considering the annual average virtual water import volumes to the EU from the largest to the smallest, separately for the green and blue components. In the case of the green water footprint, crops with green virtual water import volumes larger than 2% of the total green virtual water import related to crops were identified as the key imported products. Crops with blue virtual water import volumes larger than 3.5% of the total blue crop virtual water import to the EU were selected as the key imported products with regard to the blue water footprint.

3.7.3 Vulnerability assessment

The vulnerability of virtual water imports to the EU was assessed by elaborating drought severity and water scarcity at the producing locations of the key imported products for green and blue virtual water imports, respectively.

To assess the vulnerability level that occurs in the producing regions of the key products selected, green virtual water import maps of the key products were overlaid with drought risk maps from Gassert *et al.* (2015) (Figure 3.3). A spatial distribution of drought severity at the sub-basin scale was developed, based on the work of Sheffield and Wood (2008). This work developed a 1° by 1° gridded data set of the mean severity of drought events from 1901 to 2008 by generating a monthly soil moisture hydrograph and defining drought events as periods of time when monthly soil moisture falls below the 20th percentile. Severity was then evaluated as the multiplication of length (in months) and spatial spread (as the number of places in an area) of drought events. Gassert *et al.* (2015) averaged the results per river basin and normalized them to define five severity levels: low, low to medium, medium to high, high, extremely high. Low drought severity means that drought events are either short in time, affect a small-spread area, or both. High drought severity implies longer, more frequent and wider-spread drought events. Four levels of vulnerability were defined according to the drought severity level: low (for low and low to medium drought severity), moderate (medium to high drought severity), high (high drought severity) and very high (extremely high drought severity) (Table 3.1).

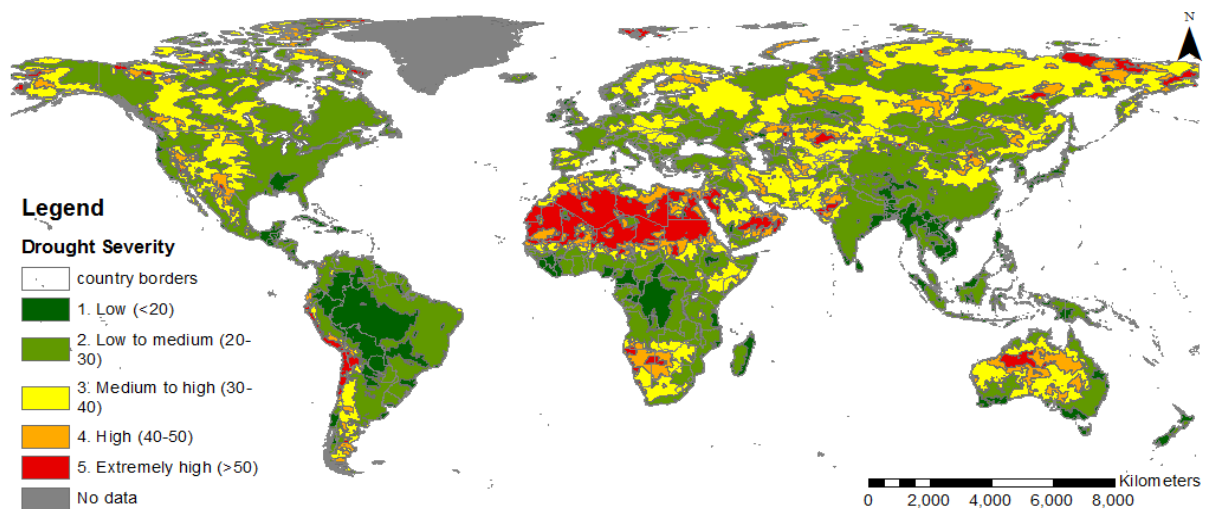


Figure 3.3. Drought severity map (from Gassert *et al.*, 2015)

The vulnerability of the selected key products for blue virtual water import was assessed by elaborating water scarcity levels at the producing locations. Blue virtual water import maps of the key products were compared with average annual water scarcity maps from Mekonnen and Hoekstra (2016) (Figure 3.4). The authors defined water scarcity as the ratio of the total blue water footprint divided by blue water availability. They calculated the blue water availability as the runoff generated minus environmental flow requirements. The classified water scarcity (WS) is defined as low if the blue water footprint does not exceed blue water availability ($WS < 1.0$); in this case, environmental flow requirements are met. Water scarcity is said to be moderate if it is in the range $1.0 < WS < 1.5$, significant if it is in the range $1.5 < WS < 2.0$, and severe if $WS > 2.0$. Four vulnerability levels were defined for the blue virtual water imports corresponding to water scarcity levels: low (low water scarcity), moderate (moderate water scarcity), high (significant water scarcity) and very high (severe water scarcity).

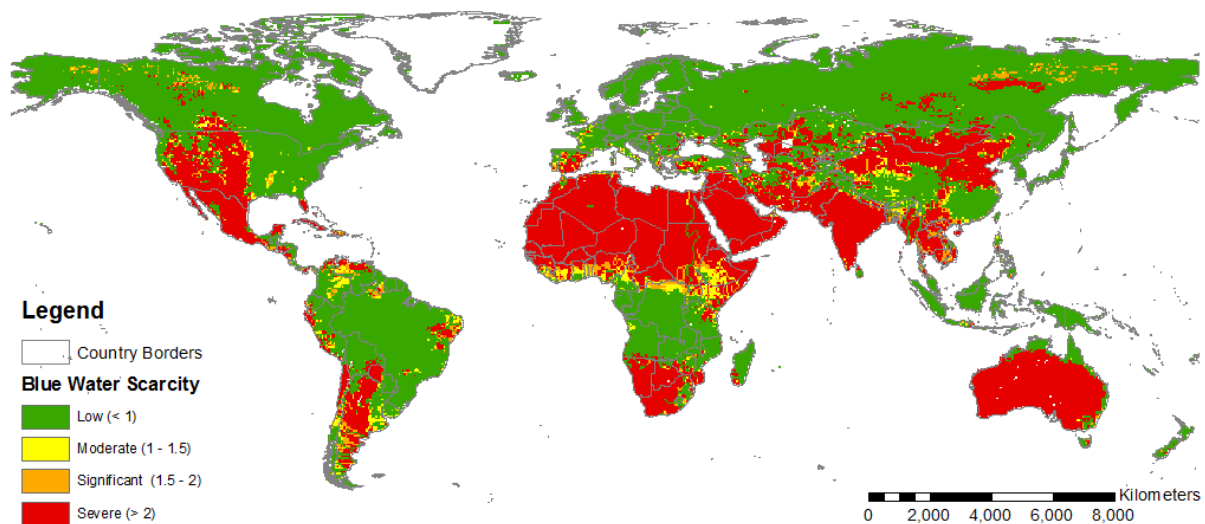


Figure 3.4. Annual average water scarcity map (from Mekonnen and Hoekstra, 2016)



Table 3.1. Vulnerability levels and corresponding drought severity index and blue water scarcity category

Vulnerability level	Normalized drought severity index (Normalized mean soil drought severity)	Blue water scarcity categories
Low	<30	<1.0
Moderate	30-40	1.0-1.5
High	40-50	1.5-2.0
Very high	>50	2.0

4 Water footprint of production and consumption and virtual water import

This section presents the water footprint of production and consumption for the EU and virtual water imports to the EU. The water footprint of production shows how internal water resources of the EU were allocated between different economic sectors. Although the focus of this report is external dependencies of the EU economy, this analysis is required in order to calculate the water footprint of consumption which shows total volume of water used, both from internal and external sources, to produce the goods consumed by EU citizens and businesses. Furthermore, it will form the basis for the analysis of the next stages of WP12; understanding how current production and consumption patterns may be altered due to climate change.

Together with the water footprint of consumption, virtual water imports to the EU reveal the dependencies of the European economy upon external water resources in other parts of the world. It forms the basis for the selection of key products for the vulnerability assessment that are presented in this report.

4.1 Water footprint of production in the EU

The average total water footprint of production in the EU was 517 km³/year for the period 2006-2013, which is 5.2% of the total water footprint of production in the world (Table 4.1). The largest part of this water footprint is green (73%), followed by grey (19%) and blue (8%). The average total water footprint of agricultural production (crop production and livestock production including grazing) for the period 2006-2013 was 460 km³/year, which is 89% of the total water footprint of production in the EU, followed by industrial production (7%) and domestic water supply (4%) (Figure 4.1). Compared to the period of 1996-2005, the water footprint of production of the EU has decreased by 15%.

Table 4.1. The water footprint of production in the EU (km³/year) by major category, average of 2006-2013

Water footprint of agricultural production			Water footprint of industrial production		Water footprint of domestic water supply	
Green	Blue	Grey	Blue	Grey	Blue	Grey
379	28	54	7	29	4	17



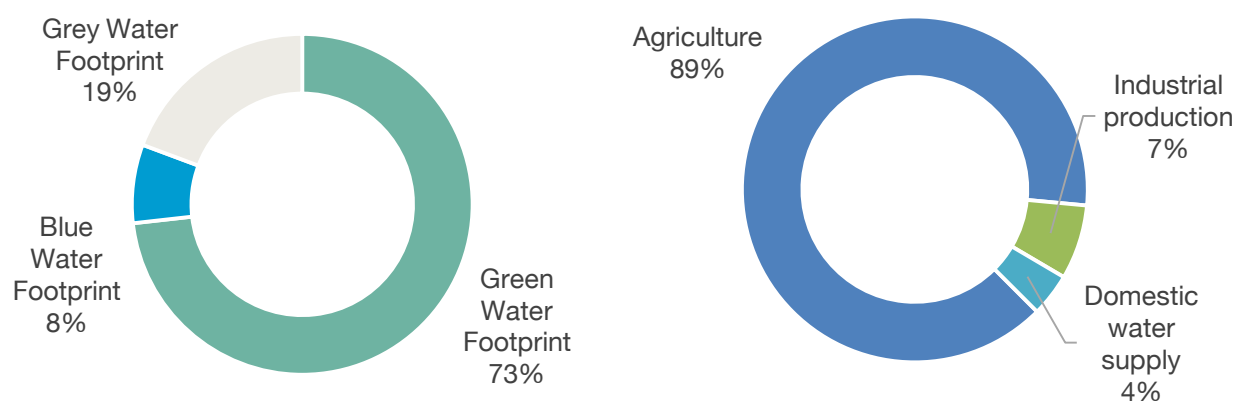


Figure 4.1. Water footprint of production in the EU, by green, blue, grey components (left) and by sector (right)

The green water footprint of production is only related to agricultural production (crop and livestock grazing). Agricultural production has the largest share (71%) of the blue water footprint of production, followed by industrial production (18%) and domestic water supply (11%). Agricultural production also has the largest share (54%) of the grey water footprint of production, followed by industrial production (29%) and domestic water supply (17%).

The annual variation of the water footprint of production in the EU for the period 2006-2013 is presented in Figure 4.2. The largest water footprint of production was in 2008 with 526 km³ and the smallest was 513 km³ in 2012.

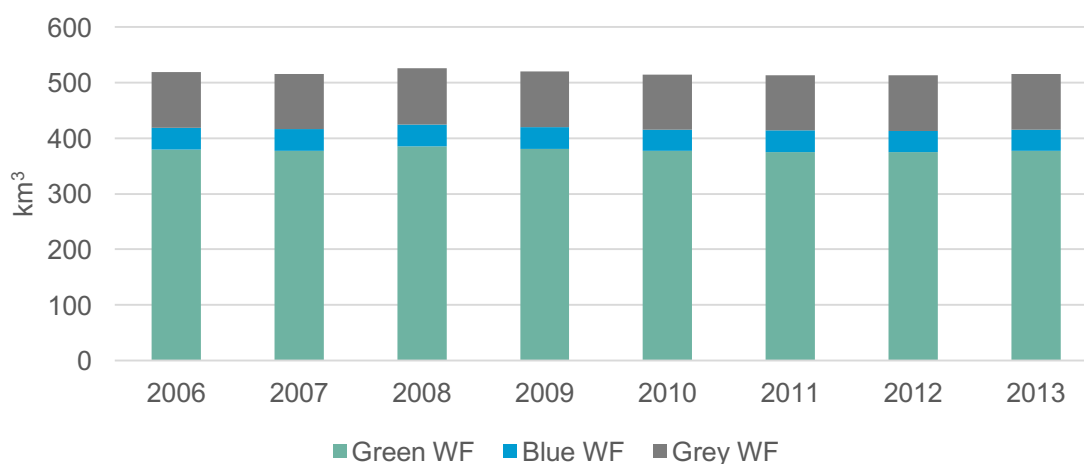


Figure 4.2. Annual water footprint of production in the EU (km³/year)

The green, blue and grey water footprint of production in the EU per country is shown in Figure 4.3. France has the largest total water footprint with 84 km³/year (16.3% of the EU). Other countries with a significant share of the total water footprint of production in the EU are: Spain

(71 km³/year); Germany (56 km³/year); Poland (54 km³/year); Italy (53 km³/year); Romania (37 km³/year); UK (25 km³/year); Hungary (20 km³/year); and Bulgaria (17 km³/year). Countries with the lowest total water footprint of production in the EU are: Malta; Luxembourg; Cyprus; Estonia; Slovenia; Latvia; and Finland. Spain has the largest blue water footprint of production (35.2% of of the EU). Other countries with a significant share of the blue water footprint of production are: Italy (15%); France (12%); Greece (9%); Germany (7%); Portugal (4%); Romania (3%); and Poland (3%). France has the largest grey water footprint of production (14.6% of the EU), followed by Italy (14%), Germany (13.5%), Poland (12%), Spain (8%), Romania (6%), and Hungary (5%). The annual average water footprint of production for all the countries in the EU is provided in Appendix E.

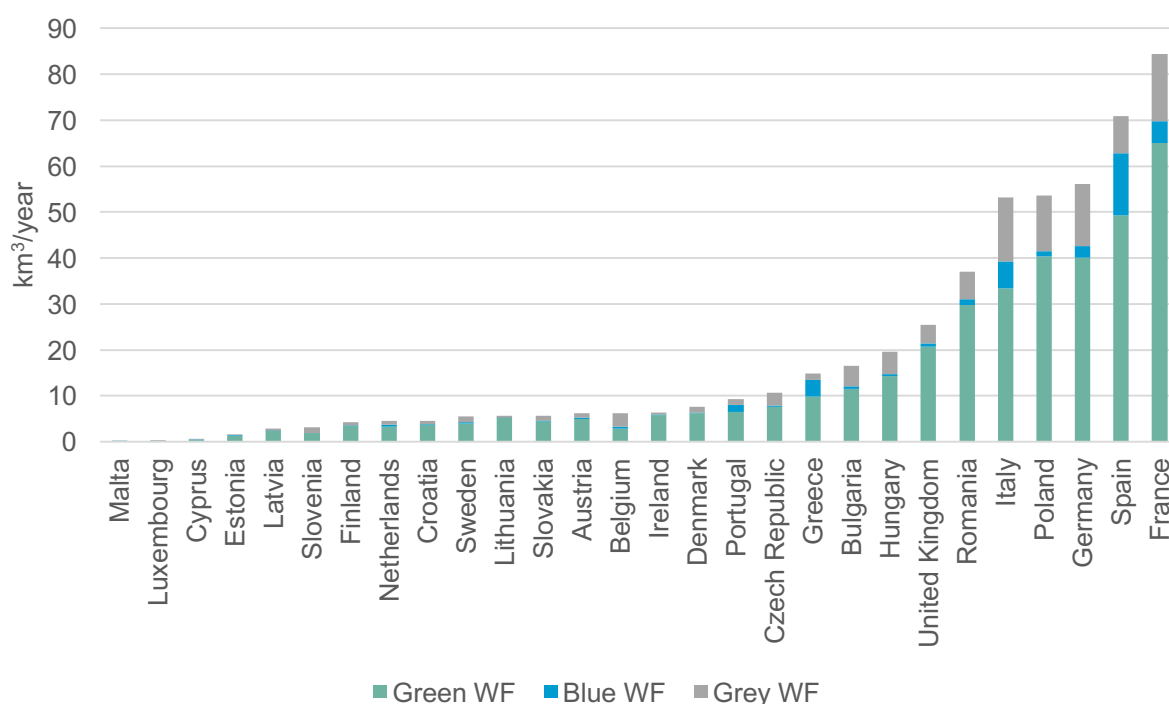


Figure 4.3. Average annual water footprint of production in EU countries (km³/year)

Crop production accounts for 86% of the agricultural water footprint of production, while livestock grazing is 13% and animal water supply is 0.4% (Table 4.2). Of the crops, cereals contribute 62% to the total water footprint of crop production. Oil crops (18%), fruits (9%) and vegetables (3%) are the other major crop groups with a significant share in the total water footprint of crop production (Figure 4.4).



Table 4.2. The water footprint of agricultural production in the EU per category (km³/year)

Water footprint of crop production			Water footprint of animal grazing	Water footprint of animal drinking and servicing
Green	Blue	Grey	Green	Blue
318	26	54	61	2

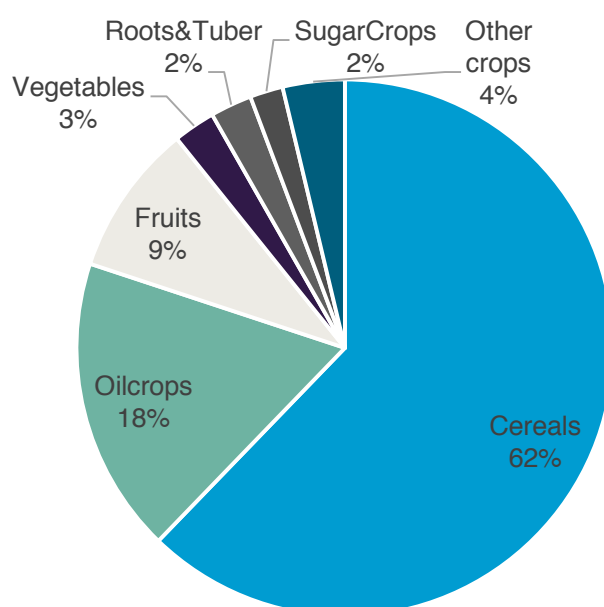


Figure 4.4. Share of water footprint per crop group of the total water footprint of crop production

Figure 4.5 presents the contribution of different crops to the green, blue and grey water footprint of total crop production in the EU. Wheat (31%), maize (11%), barley (11%), olives (7%), rapeseed (7%), grapes (4%) and sunflowers (4%) together account for 75% of the total water footprint of crop production (Figure 6.4). Maize production has the largest blue water footprint of crop production in the EU (19%), followed by olives (15%), rice (8%), seed cotton (6%) and grapes (5%). Wheat production has the largest green water footprint of crop production (32%), followed by barley (11%), maize (10%), olives (7%), rapeseed (7%) and grapes (4%). Wheat production has the largest contribution to the grey water footprint of crop production in the EU (37%), followed by barley (15%), maize (13%), rapeseed (7%) and potatoes (5%).

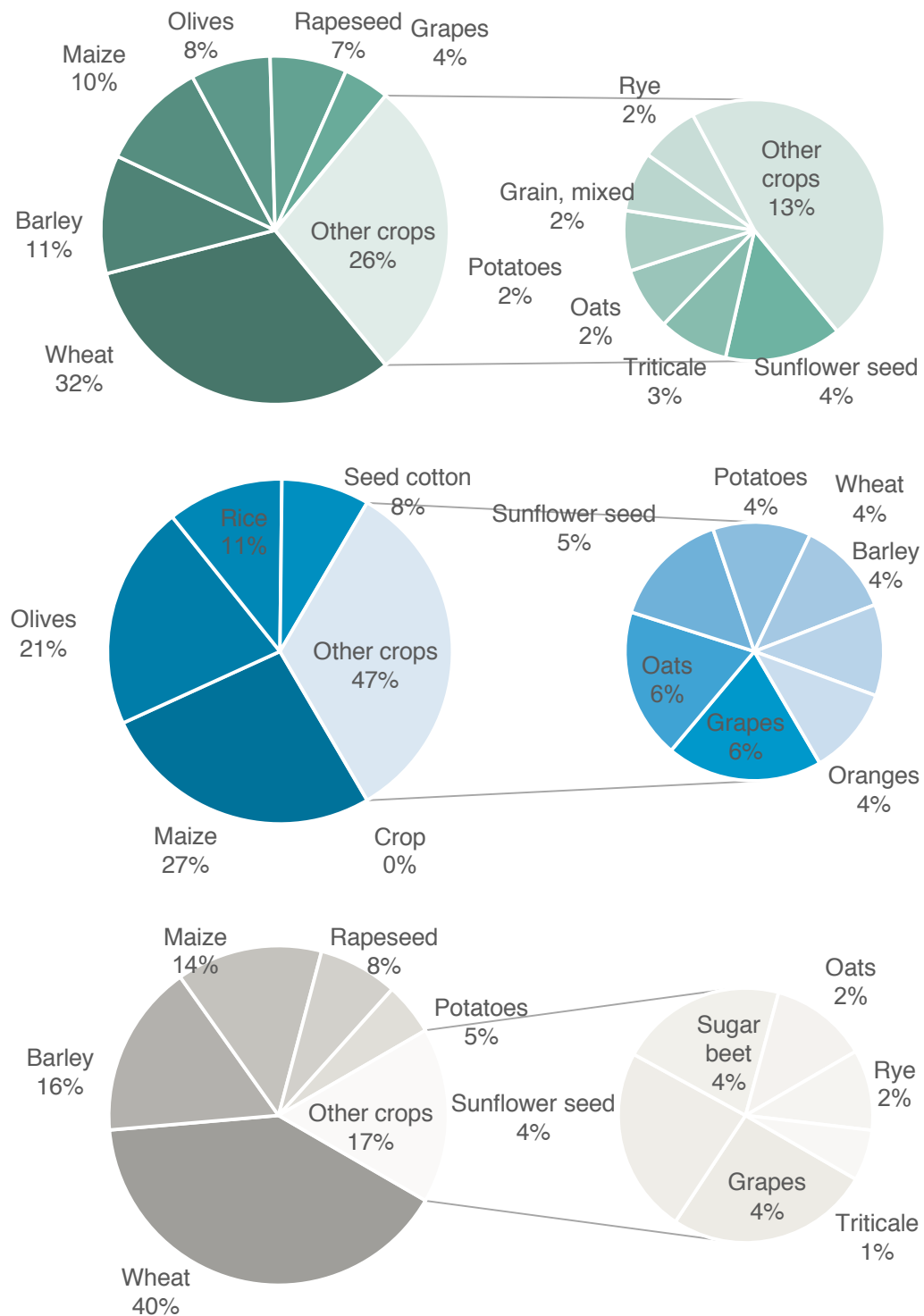


Figure 4.5. The contribution of different crops to the green, blue and grey water footprint of total crop production in the EU

The water footprint of industrial production in the EU for the period 2006-2013 was 36 km³/year. This water footprint is dominated (81%) by the grey component, which represents pollution due to industrial production and is equal to 329 km³/year. The largest grey water footprints of

industrial production are located in France (18.8%), Italy (16.3%), Poland (14%), Romania (10%) and Germany (9%).

The water footprint of domestic water supply in the EU for the period 2006-2013 was 21 km³/year. The majority of it is grey water footprint (79%), which represents pollution related to domestic water use. This water footprint is large where population concentrations are high and is located mainly in France, Germany, UK, Poland, Italy and Spain.

4.2 Water footprint of consumption in the EU

The total water footprint of consumption in the EU for the period 2006-2013 was 600 km³/year. The green component is the largest and is equal to 72% of the total water footprint of consumption. The blue and grey water footprints of the EU consumption are 5% and 23% of the total respectively (Figure 4.6). About 60% of the water footprint of EU consumption is internal and 40% is external (Table 4.3). This means that almost half of the water resources consumed or polluted to make all the products consumed by EU citizens are outside the boundaries of EU countries.

Table 4.3. The water footprint of consumption in the EU (km³/year) by internal and external components

Total water footprint of consumption [km³/year]									Ratio external / total water footprint (%)
Internal			External			Total			
Green	Blue	Grey	Green	Blue	Grey	Green	Blue	Grey	
262	22	75	170	8	64	432	30	138	

Agricultural products account for the largest share (82%) of the total water footprint of EU citizens. Consumption of industrial products and domestic water supply contribute 15% and 3% to the total water footprint of consumption, respectively (Figure 4.6).

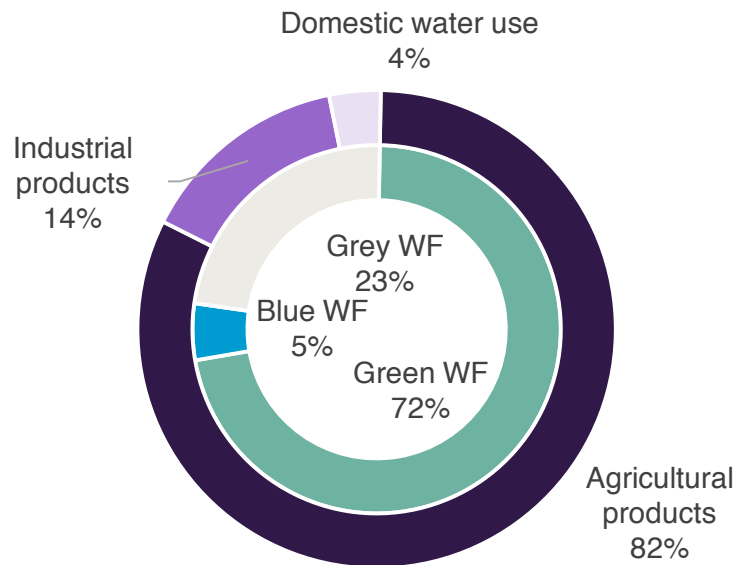


Figure 4.6. The water footprint of consumption in the EU by sector (outer circle) and by component (inner circle)

The water footprint of consumption related to agricultural products for the period 2006-2013 was 493 km³/year, around 88% of which is green, while the blue and the grey components of the agricultural water footprint of consumption are 4% and 8%, respectively. The water footprint of consumption related to industrial products was 86 km³/year. Around 92% of it is the grey water footprint. The water footprint of consumption related to domestic water supply was 21 km³/year, 79% of which is the grey component.

The blue water footprint of consumption is dominated by agricultural products (63%). Consumption of industrial products contributes 23% and domestic water supply 14%. The grey water footprint of consumption is mainly due to industrial products (57%), followed by agricultural products (31%) and domestic water use (12%).

The proportion of the total water footprint of consumption resulting from the consumption of products outside the EU is higher for industrial products (70%) as compared to agricultural products (37%). Furthermore, the proportion of the total water footprint of consumption coming from sources outside the EU is higher for the grey water footprint (46%) than for the green water footprint (39%) or the blue water footprint (28%) (Table 4.4).



Table 4.4. The water footprint of consumption in the EU (km³/year) by sector, average of 2006-2013

Water footprint of consumption of agricultural products						Water footprint of consumption of industrial products				Water footprint of domestic water supply	
Internal			External			Internal		External			
Green	Blue	Grey	Green	Blue	Grey	Blue	Grey	Blue	Grey	Blue	Grey
262	13	36	170	5	6	4	22	3	57	4	17

4.3 Virtual water import to the EU

Virtual water imports are determined by two elements: quantity of products (in physical mass) imported and the water footprint of the product (m³ per unit of mass of product). The total virtual water import to the EU for the period 2006-2013 was 333 km³/year. Crop products account for the largest share of the virtual water import to the EU (72%) followed by industrial products (22%) and animal products (6%) (Table 4.5).

Table 4.5. Virtual water import to the EU (km³/year) by major product groups, average of 2006-2013

Crop products			Animal products			Industrial products	
Green	Blue	Grey	Green	Blue	Grey	Blue	Grey
223	9	9	19	0.5	0.3	4	68

The green water footprint of imported products was 223 km³/year, which is 73% of the total virtual water import. Soybean products account for 27% of the total green virtual water import. Cocoa products (19%), coffee products (14%), palm oil products (9%) and animal products (8%) all have a significant share in the green virtual water import (Figure 4.7).

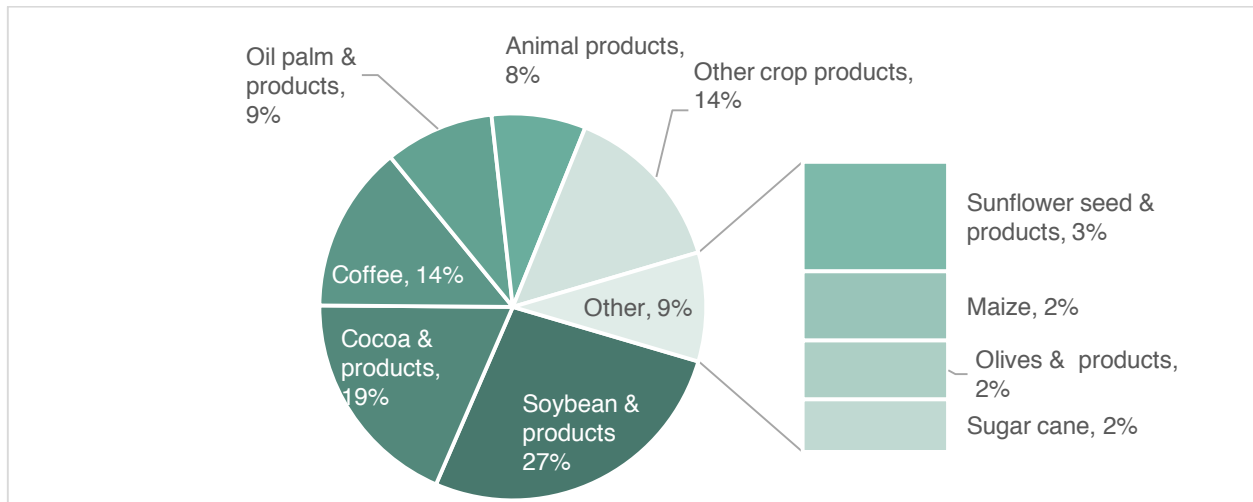


Figure 4.7. Green virtual water import to the EU by product group, average of 2006-2013

Industrial products account for largest share (33%) of the blue water footprint of imported products, followed by rice (9%), sugar cane (7%), cotton (7%), almonds (4%), pistachios (3%), animal products (3%), grapes & wine (3%) and soybean products (3%) (Figure 4.8).

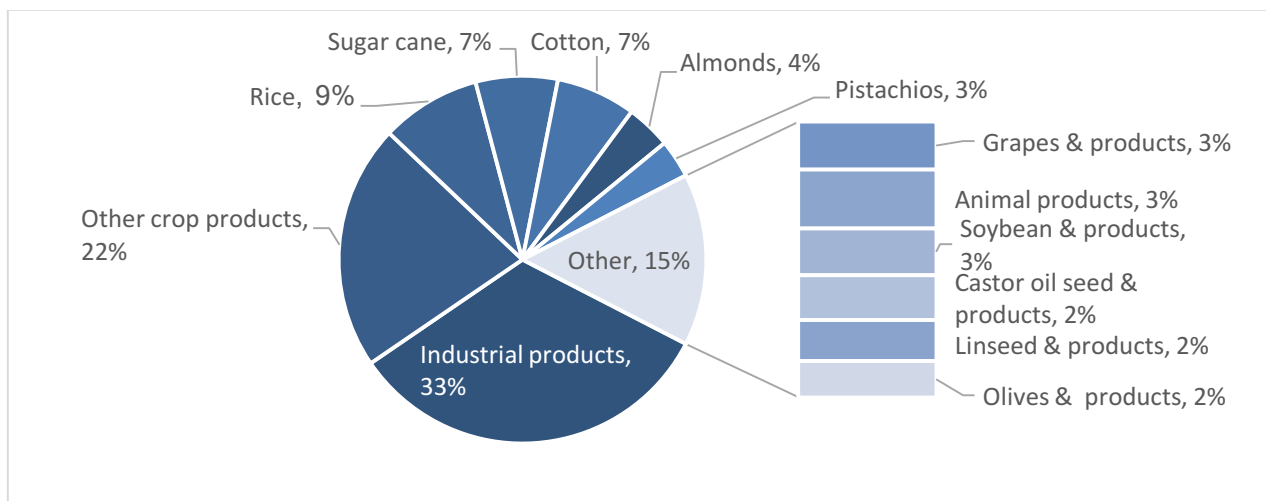


Figure 4.8. Blue virtual water import to the EU by product group, average of 2006-2013

The grey water footprint of imported products was 77 km³/year. Industrial products account for the largest share of the grey water footprint (88%), followed by coffee products (2%), palm oil (1%), almonds (1%), pulses (1%), maize (1%), soybean (1%), beans (1%) and tobacco and related products (1%) (Figure 4.9).

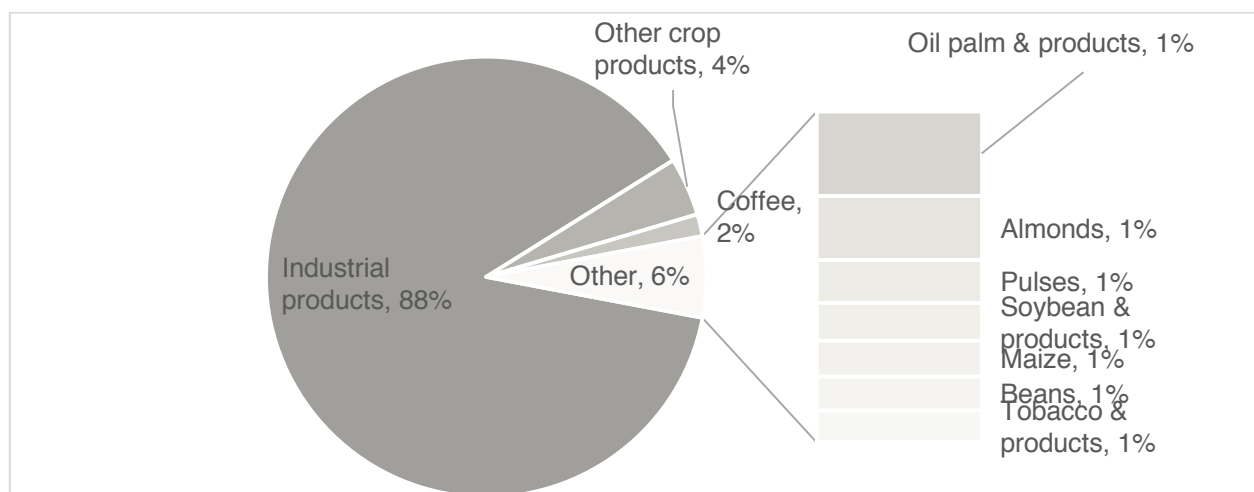


Figure 4.9. Grey virtual water import to the EU by product group, average of 2006-2013

The majority of the virtual water imports to the EU originate from Brazil (16%), Ukraine (12%), Argentina (8%), Indonesia (7%), Ivory Coast (6%), Russia (5%), the USA (4%), Ghana (3%), China (3%), India (3%) and Malaysia (3%) (Figure 4.10). More than 90% of total virtual water import to the EU from Brazil, Argentina, Ivory Coast, Ghana, Indonesia and Malaysia is related to the import of crop products and are dominated by the green water footprint, which is more than 95% of the total virtual water import from those countries. More than half of the total virtual water import from the USA is from crop products, with the largest share being the green water footprint (52%) followed by grey (35%) and blue (15%) water footprint components (Figure 4.11). In the case of China and Russia, the total virtual water imports to the EU during this period were related to the grey water footprint (76% and 74% respectively), and were associated with the import of industrial products.

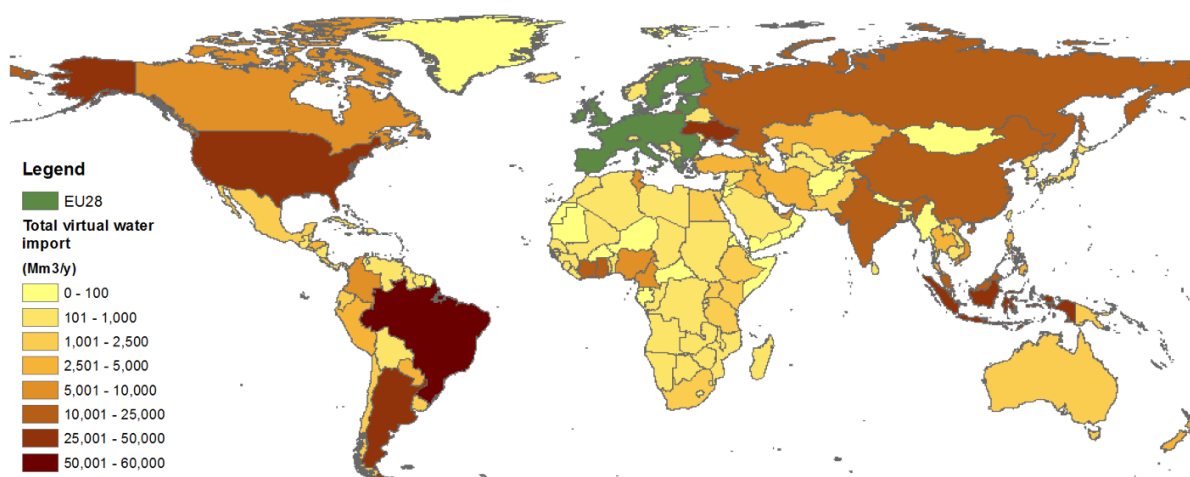


Figure 4.10. Total virtual water imports to the EU per country (Mm3/year)

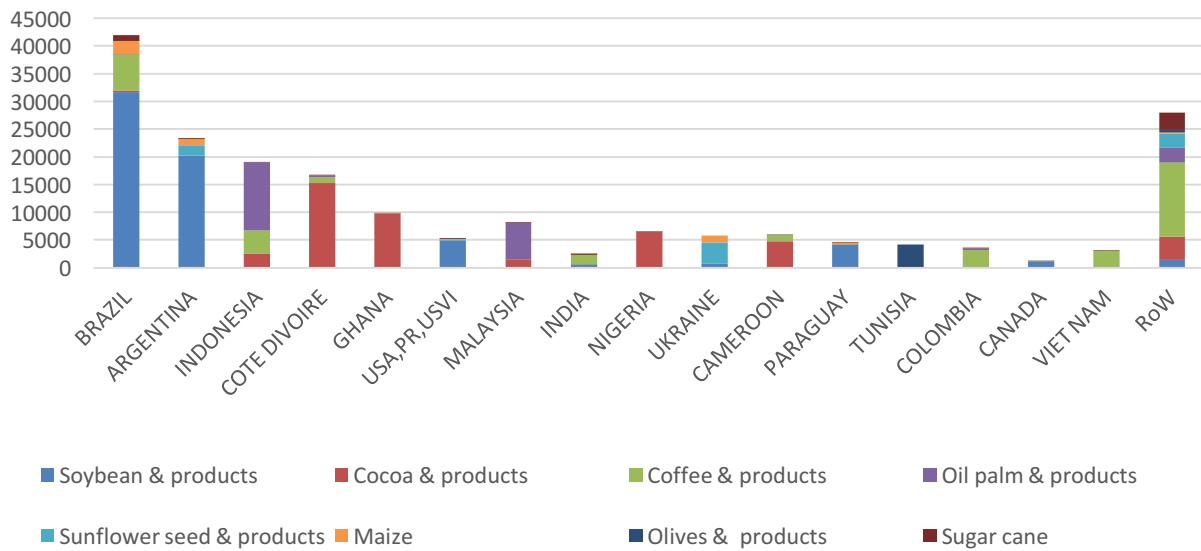


Figure 4.11. Green virtual water imports to the EU per country, per crop product and product groups (Mm³/year)

The USA (17%), India (9%), Pakistan (8%), Turkey (6%), Egypt (6%), Iran (4%) and South Africa (4%) are the largest blue virtual water exporters to the EU related to crop products, accounting for 54% of the blue virtual water import by the EU (Figure 4.12). The crop products with the largest blue virtual water exports from these countries to the EU are: almonds (33% of the EU's blue virtual water import from the USA); rice (24% and 21% of EU's blue virtual water import from Egypt and India respectively); cotton products (33% of EU's blue virtual water import from Turkey); pistachios (88% of EU's blue virtual water import from Iran); and grapes (24% of EU's blue virtual water import from South Africa) (Figure 4.13).

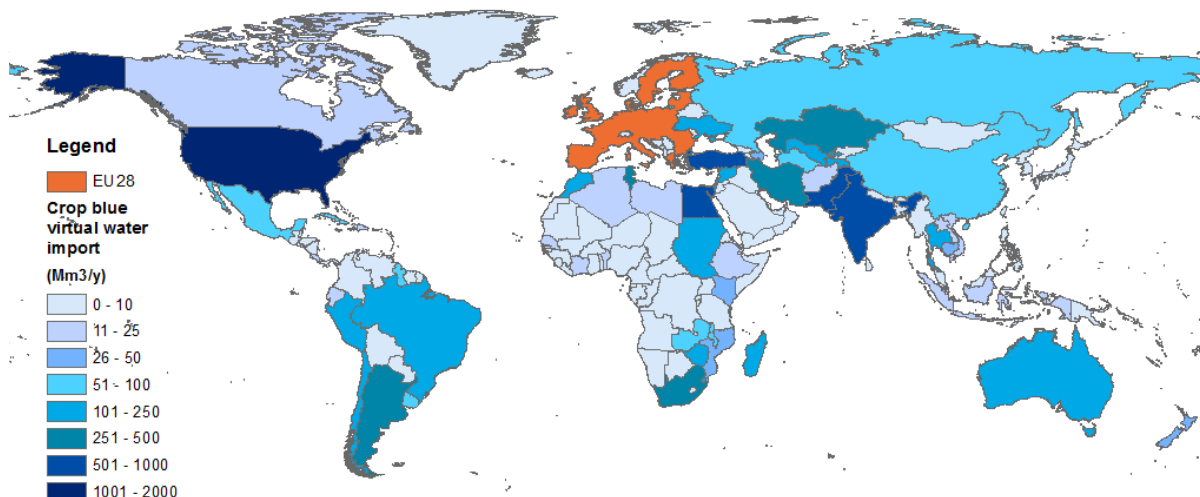


Figure 4.12. Blue virtual water exports to the EU related to import of crop products (Mm³/year)



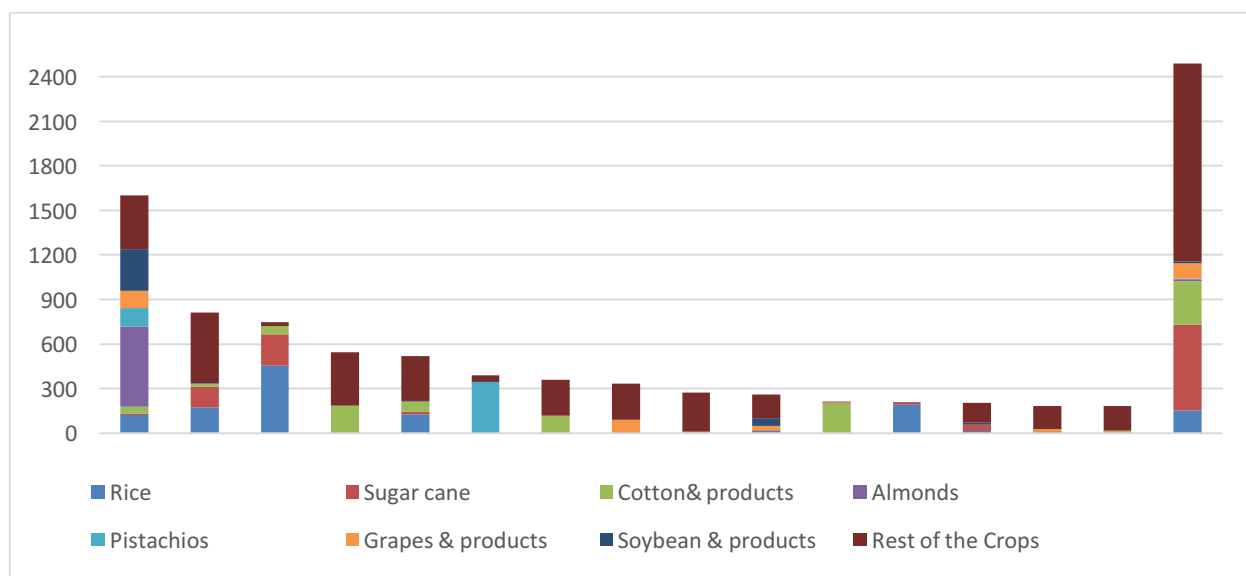


Figure 4.13. Blue virtual water imports to the EU per country, per crop product group (Mm³/year)

Over 75% of the virtual water import to the EU from China, Ukraine and Russia is related to industrial products. The majority of this industrial virtual water import is grey. The grey virtual water import related to industrial products comes mainly from: Ukraine (46%); Russia (16%); China (11%); the USA (4%); Kazakhstan (4%); and India (2%) (Figure 4.14).

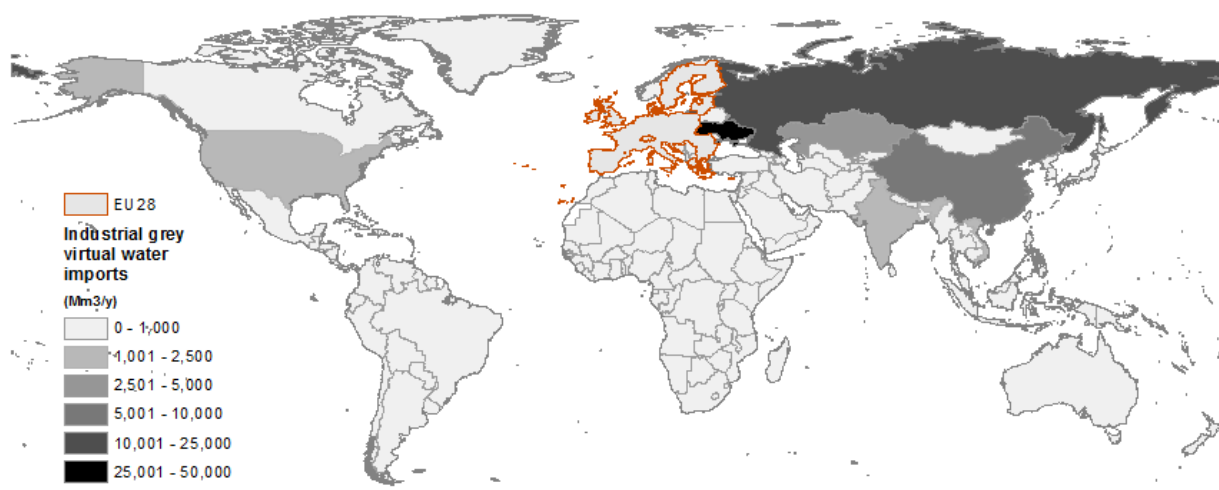


Figure 4.14. Grey virtual water imports to the EU for industrial products, (Mm³/year)

When the external water footprint of the EU is compared with virtual water imports, it is seen that a portion of the virtual water imports to the EU is not consumed domestically. Around 3% of the virtual water import is re-exported after imported raw materials have been processed. A typical example of such processing is related to cocoa products. Crops are imported from Asia and

Latin America to be used as an input to cocoa industries. Once processed within the EU, a portion of cocoa products is exported to countries outside the EU.

4.4 Dependencies of the European economy on external water resources

The dependency of the European economy was assessed separately for green water resources (rainfall) and blue water resources (surface and groundwater). Overall, the European economy is 41% dependent on external green water resources, which is categorized as a “moderate dependency”. Soybean, pistachios, cotton, sorghum, avocado, hazelnuts and rice are some products for which the European economy has a “high dependency” on external green water resources (Table 4.6). “Absolute dependency” on external green water resources, for products which are not grown in Europe, exists for products such as coffee, cocoa, palm oil, coconuts, tropical fruits, vanilla, sugar cane and tea.

Table 4.6. EU dependencies on external green virtual water resources by crop product group

Crop products	Dependency on external green water resources (%)	Level of dependency
Cocoa & products	100	absolute dependency
Coffee & products	100	absolute dependency
Oil palm & products	100	absolute dependency
Coconuts & coco products	100	absolute dependency
Tropical fruits	100	absolute dependency
Castor oil seed & products	100	absolute dependency
Cinnamon	100	absolute dependency
Vanilla	100	absolute dependency
Sugar cane	100	absolute dependency
Tea & products	100	absolute dependency
Bananas	98	very high dependency
Soybean & products	98	very high dependency
Pistachios	83	very high dependency



Tobacco & products	82	very high dependency
Linseed & products	78	very high dependency
Cotton & products	75	very high dependency
Sorghum	75	very high dependency
Pulses	73	high dependency
Rice	62	high dependency
Hazelnuts	60	high dependency
Avocados	57	high dependency
Beans	51	high dependency
Oranges & products	40	moderate dependency
Sunflower seed & products	39	moderate dependency
Walnuts	31	moderate dependency
Peas	29	moderate dependency
Olives & products	18	low dependency
Maize	14	low dependency
Almonds	10	low dependency

The dependency of the European economy on external blue water resources (surface and groundwater) is only 27% and considered as a “low dependency”. This dependency is 40% with respect to industrial products and is significantly larger for some crops such as sugar cane, coffee, dates, tea, and vanilla, on which the EU has an “absolute dependency”, pistachios, banana, tobacco and avocados, on which it has a “very high dependency” and almonds, hazelnuts and soybean, on which it has a “high dependency” (Table 4.7).

Table 4.7. External blue water dependencies by crop product group

	Dependency on external blue water sources (%)	Level of dependency
Sugar cane	100	absolute dependency
Castor oil seed	100	absolute dependency
Coffee & products	100	absolute dependency
Dates	100	absolute dependency
Tea & products	100	absolute dependency
Vanilla	100	absolute dependency
Tropical fruits	100	absolute dependency
Pistachios	98	very high dependency
Bananas	85	very high dependency
Linseed & products	90	very high dependency
Avocados	83	very high dependency
Tobacco & products	91	very high dependency
Sorghum	92	very high dependency
Almonds	62	high dependency
Soybean & products	63	high dependency
Hazelnuts	63	high dependency
Walnuts	70	high dependency
Grapes, wine & other products	23	low dependency
Olives & products	7	low dependency
Oranges & products	22	low dependency
Maize	4	low dependency



Potatoes	12	low dependency
Sunflower seed & products	9	low dependency
Apples & products	19	low dependency
Rice, paddy	38	moderate dependency
Cotton & products	39	moderate dependency
Plums & products	43	moderate dependency
Pears & products	25	moderate dependency

4.5 Key imported products and their producing regions

The key imported products are those that contribute significantly to the size of virtual water imports to the EU. As their virtual water import volumes are large, the dependency of the European economy on the water resources in the producing regions of these commodities is higher. Thus, vulnerability of these products to drought and climate change in their producing regions may directly affect the European economy and the supplies it depends on. Industrial products and livestock products are not included on the list of key imported products, because the exact locations where each industrial commodity and livestock product is produced are not known or are only known at the country level, which makes it difficult to conduct a vulnerability assessment.

The key imported products were identified separately for the green and blue virtual imports in order to assess vulnerabilities due to drought (green component) and water scarcity (blue component). The grey virtual water imports were not included in the key product identification because they are not directly related to the blue water availability in the producing regions, and changes in blue water availability may or may not affect the supply of the products to the European economy.

Soybean, cocoa, coffee, palm oil, sunflower, maize and olives were selected as key products from the perspective of green virtual water import and represent around 81% of the total green virtual water import to the EU (Figure 4.7). Soybean is the crop with the largest virtual water import volume to the EU with imports coming from Argentina, Brazil and the USA. Europe relies on soybean import to meet demand for meat and dairy products. Soybean is little grown in the EU relative to European demand and its cultivation has important economic and political implications. EU demand far exceeds its own internal production, which is only 0.9 million tonnes/year. Imports reach around 30-35 million tonnes per year (average for 2006-2013). The deficit in soybean production in the EU is an important risk for the EU economy due to the need for, and reliance on, imports. The map of virtual water import to the EU related to soybean is given in Figure 4.15.

The largest green virtual water import volumes for cocoa come from the Ivory Coast (34%), Ghana (23%), Nigeria (14%), Cameroon (11%) and Indonesia (6%). Cocoa is the main ingredient

used by the cocoa sector in Europe and it is fully dependent on import. Figure 4.16 presents the green virtual water import to the EU.

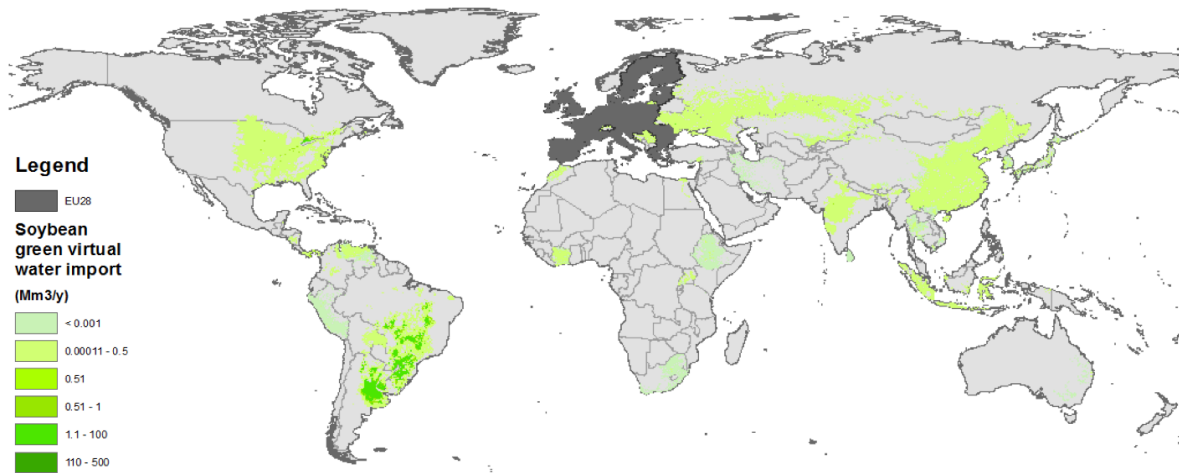


Figure 4.15. Production locations and green virtual water import to the EU related to soybean (Mm³/year)

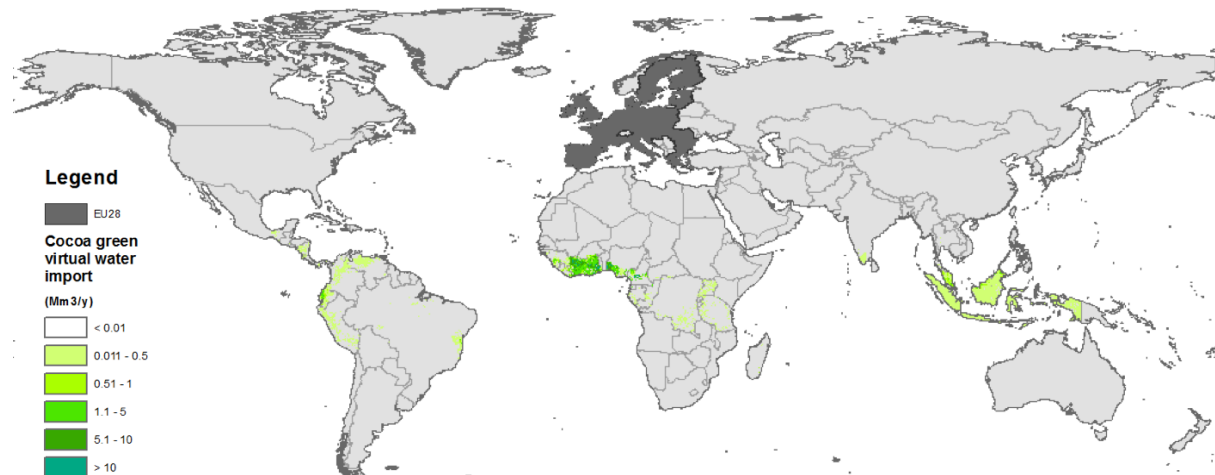


Figure 4.16. Production locations and green virtual water import to the EU related to cocoa (Mm³/year)

The largest green virtual water flow related to palm oil products originates from Indonesia (55%), followed by Malaysia (29%) and Papua New Guinea (9%). The green virtual water import map is given in Figure 4.17. Palm oil is used in the production of a wide range of goods and services from food products like crisps and biscuits to household goods, such as washing powder, to health and beauty products. It is also used as a source of energy. It is estimated that palm oil is associated with a contribution to the EU GDP of around €2.7 billion (Europe Economics, 2014).

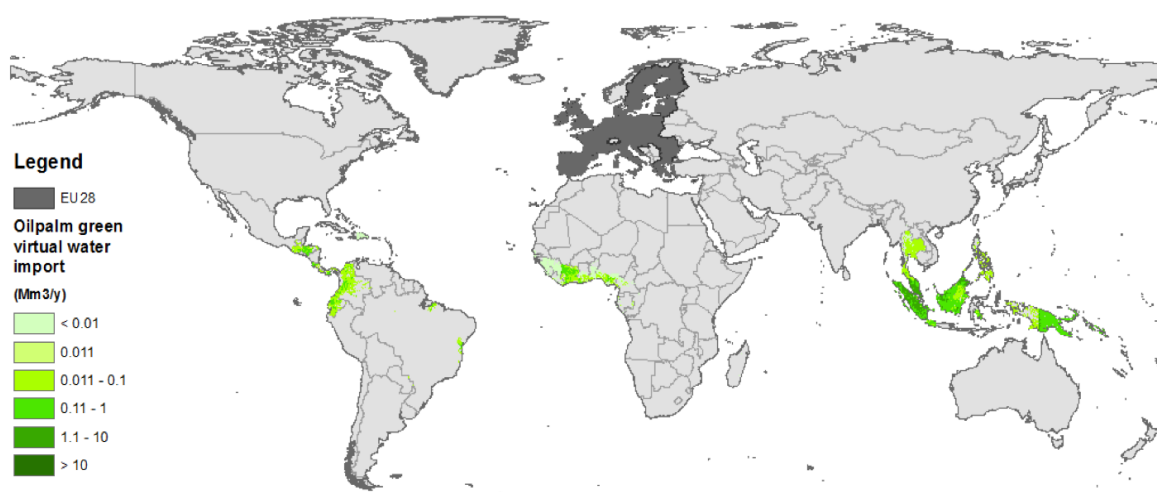


Figure 4.17. Production locations and green virtual water import to the EU related to oil palm (Mm³/year)

Figure 4.18 shows the green virtual water imports to the EU related to coffee. The largest green virtual water imports for coffee come from Brazil (19%) and Indonesia (12%).

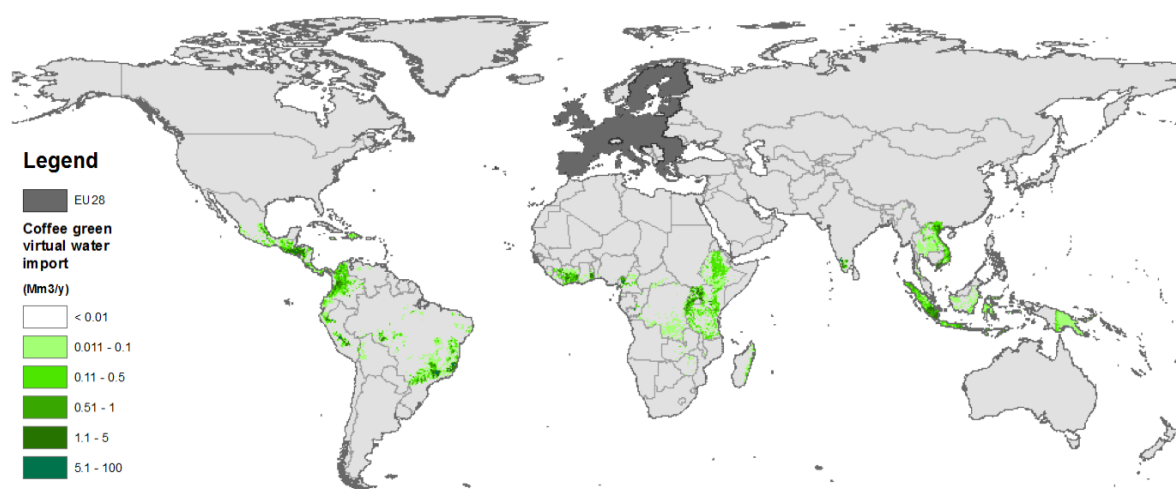


Figure 4.18. Production locations and green virtual water import to the EU related to coffee (Mm³/year)

The largest green virtual water imports to the EU related to maize come from Brazil (43%), Ukraine (23%) and Argentina (21%). The majority of the green virtual water imports related to olives come from Tunisia (89%). The green virtual water imports related to sunflower originate from Ukraine (45%), Argentina (22%) and Russia (19%).

The key products selected from the blue virtual water perspective are rice, sugar cane, cotton, almonds, pistachios, grapes and soybean, which together represent 54% of the total blue virtual water import to the EU.

The largest blue virtual water imports related to rice are from Pakistan (36%), Thailand (15%), India (14%), Egypt (10%), the USA (10%) and Uruguay (5%) (Figure 4.19). Sugarcane-related blue virtual water imports are mainly from Pakistan (21%), India (14%), Swaziland (12%), Zimbabwe (8%), Zambia (6%) and Sudan (5%) and (Figure 4.20).

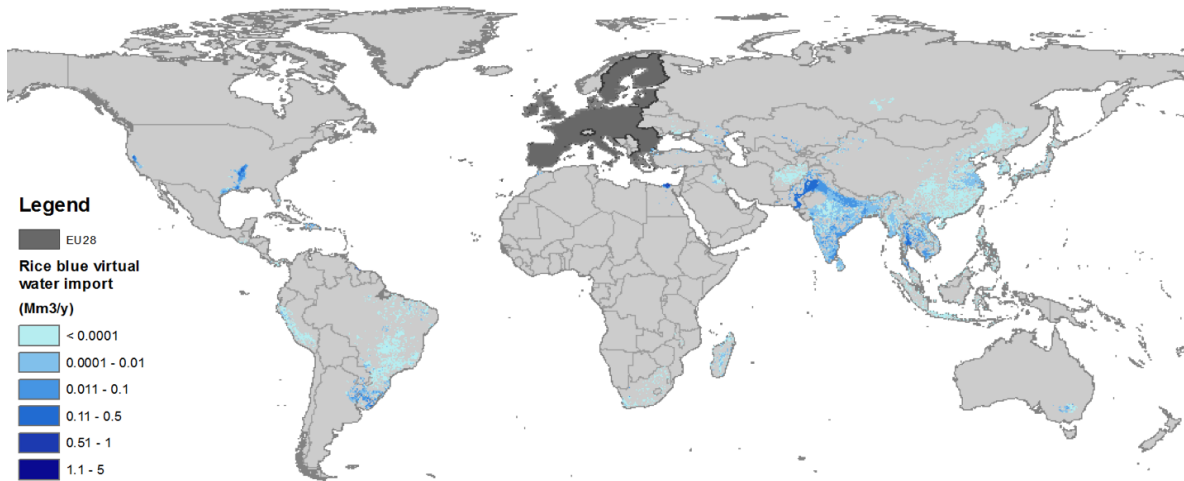


Figure 4.19. Production locations and blue virtual water import to the EU related to rice (Mm³/year)

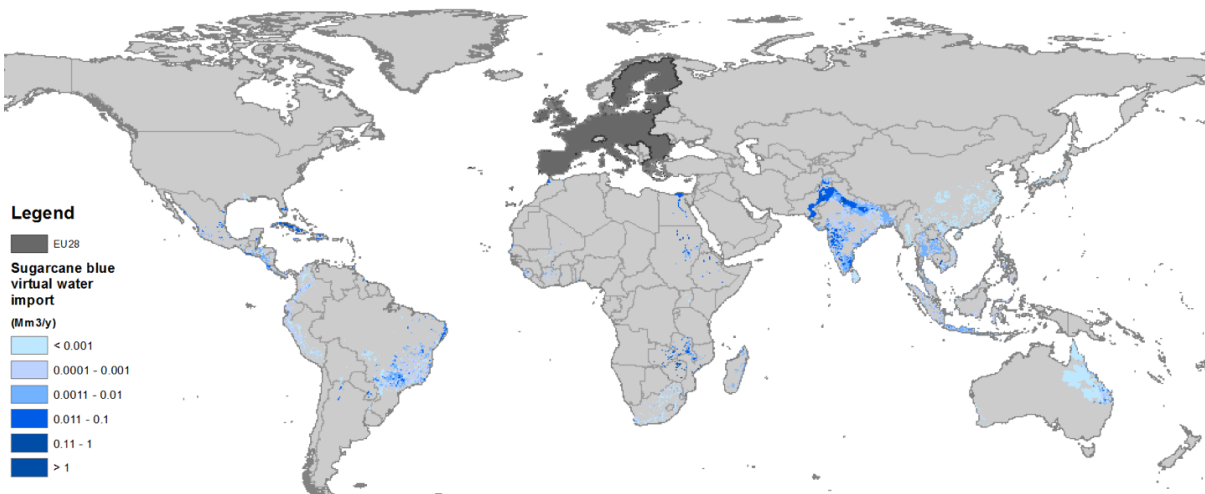


Figure 4.20 Production locations and blue virtual water import to the EU related to sugar cane (Mm³/year)

Uzbekistan (20%), Turkey (18%), Tajikistan (14%), Kazakhstan (11%), Egypt (7%) and Pakistan (6%) are the largest contributors to blue virtual water import to the EU (Figure 4.21).

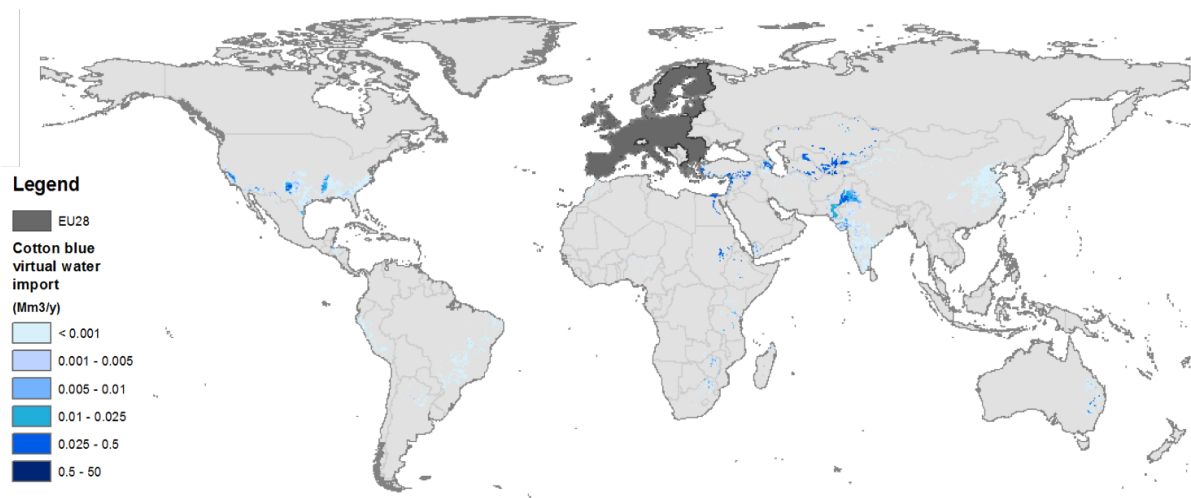


Figure 4.21. Production locations and blue virtual water import to the EU related to cotton (Mm³/year)

5 Vulnerability assessment

5.1 Vulnerability of green virtual water import to the EU

Around 99.5% of the green virtual water import to the EU related to soybean comes from the locations with a low drought risk, thus the vulnerability level is categorized as “low”. The rest of the soybean-related green virtual water imports’ vulnerability level is classified as “moderate” (0.5%) (Figure 5.1). Similar to soybean, the vulnerability level of more than 90% of the green virtual water imports related to oil palm (Figure 5.2), coffee (Figure 5.3), cocoa (Figure 5.4), sunflower and maize are determined as “low”. Only in the case of olives, around 32% of the green virtual water imports to the EU is sourced from locations with a “moderate” vulnerability level, mainly located in Tunisia.

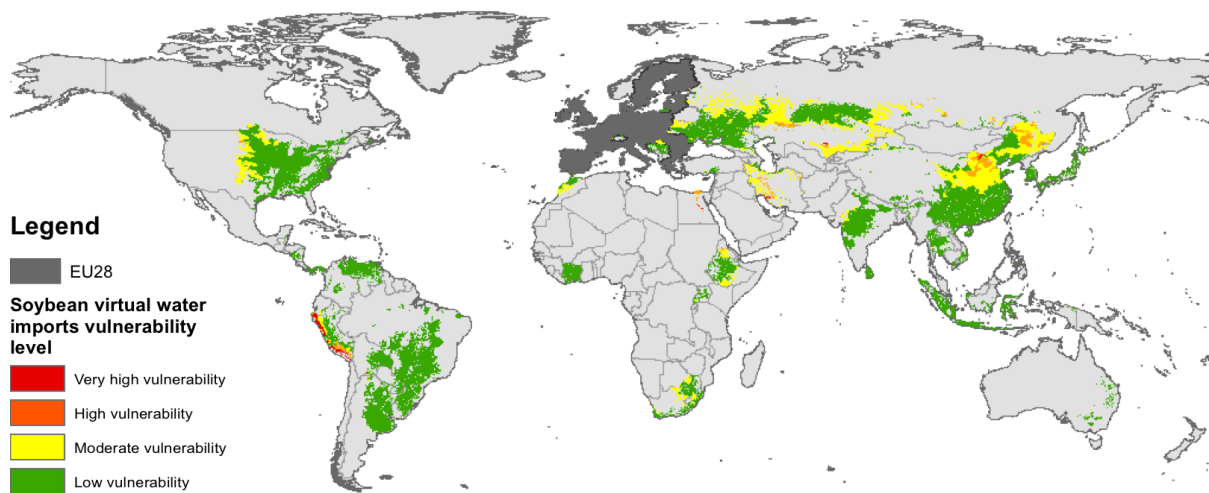


Figure 5.1. Vulnerability level for green virtual water import to the EU related to soybean

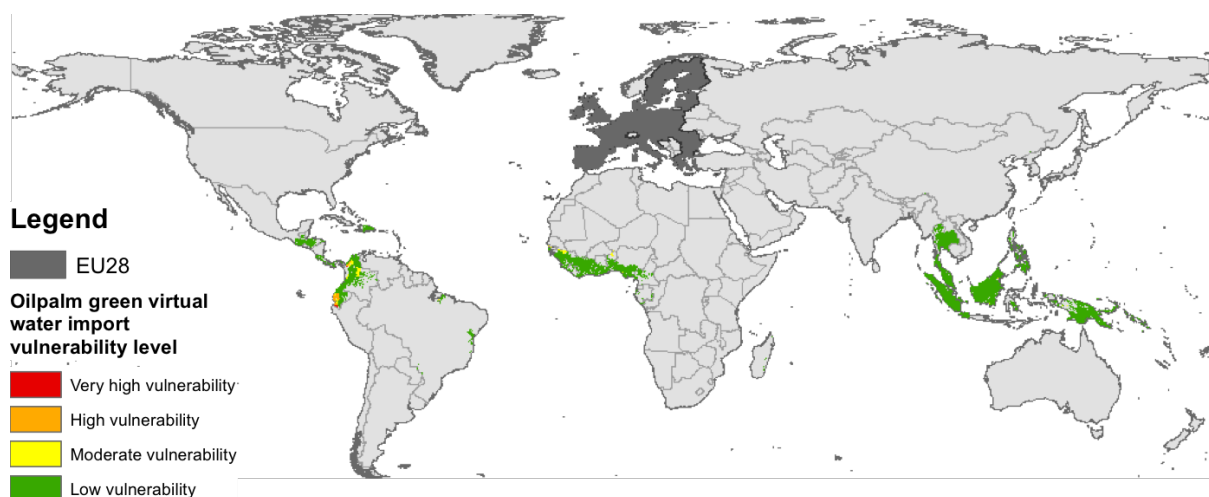


Figure 5.2. Vulnerability level for green virtual water imports to the EU related to oil palm



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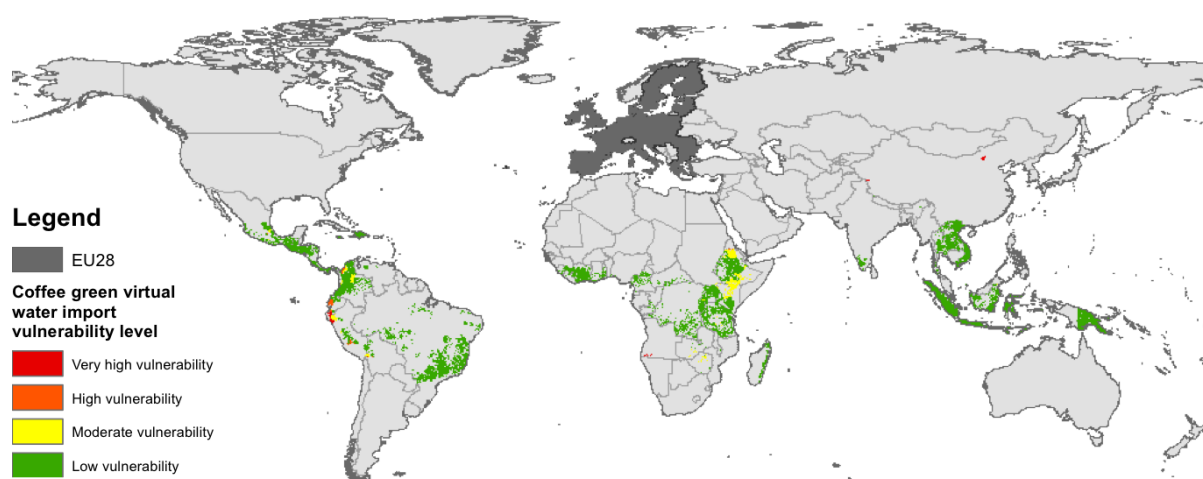


Figure 5.3. Vulnerability level for green virtual water imports to the EU related to coffee

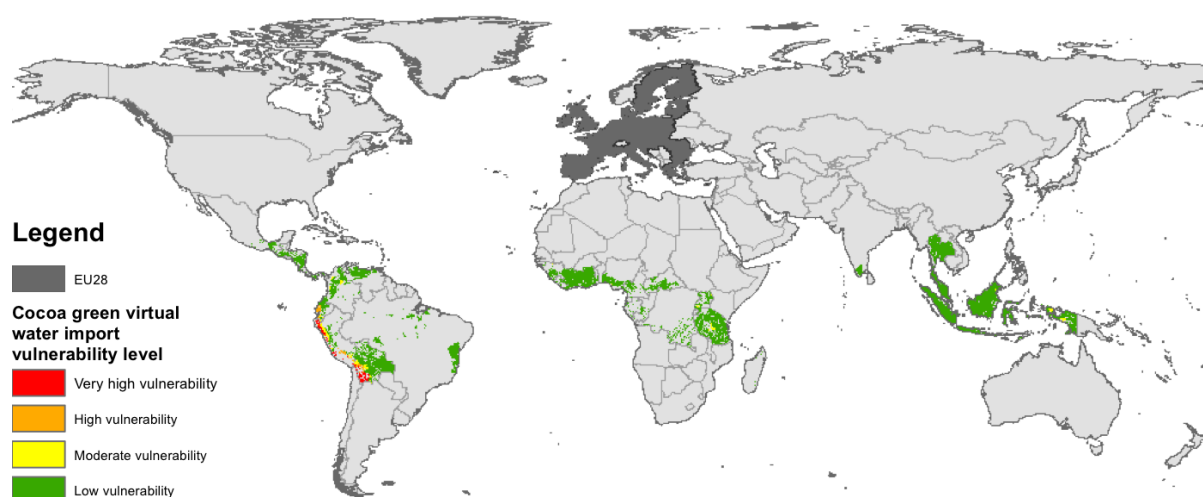


Figure 5.4. Vulnerability level for green virtual water imports to the EU related to cocoa

5.2 Vulnerability of blue virtual water import to the EU

The key products for blue virtual water import are rice, sugar cane, cotton, almonds, pistachios, grapes and soybean, which represent 54% of the total crop related blue virtual water imports to the EU. These key products are sourced from areas under significant or severe water scarcity, thus making the majority of blue virtual water imports “highly vulnerable”. For example, in the case of almonds, 91% of the blue virtual water imports for almonds imported to the EU is categorized as “highly vulnerable”. Similarly, a high percentage of blue virtual water imports to the EU related to the other key products is produced in locations under significant or severe water scarcity: pistachios (87%), grapes (74%), rice (70%), cotton (70%) and sugar cane (56%). Maps of the vulnerability levels of blue virtual water imports to the EU related to rice, cotton and sugar cane are presented in Figure 5.5.

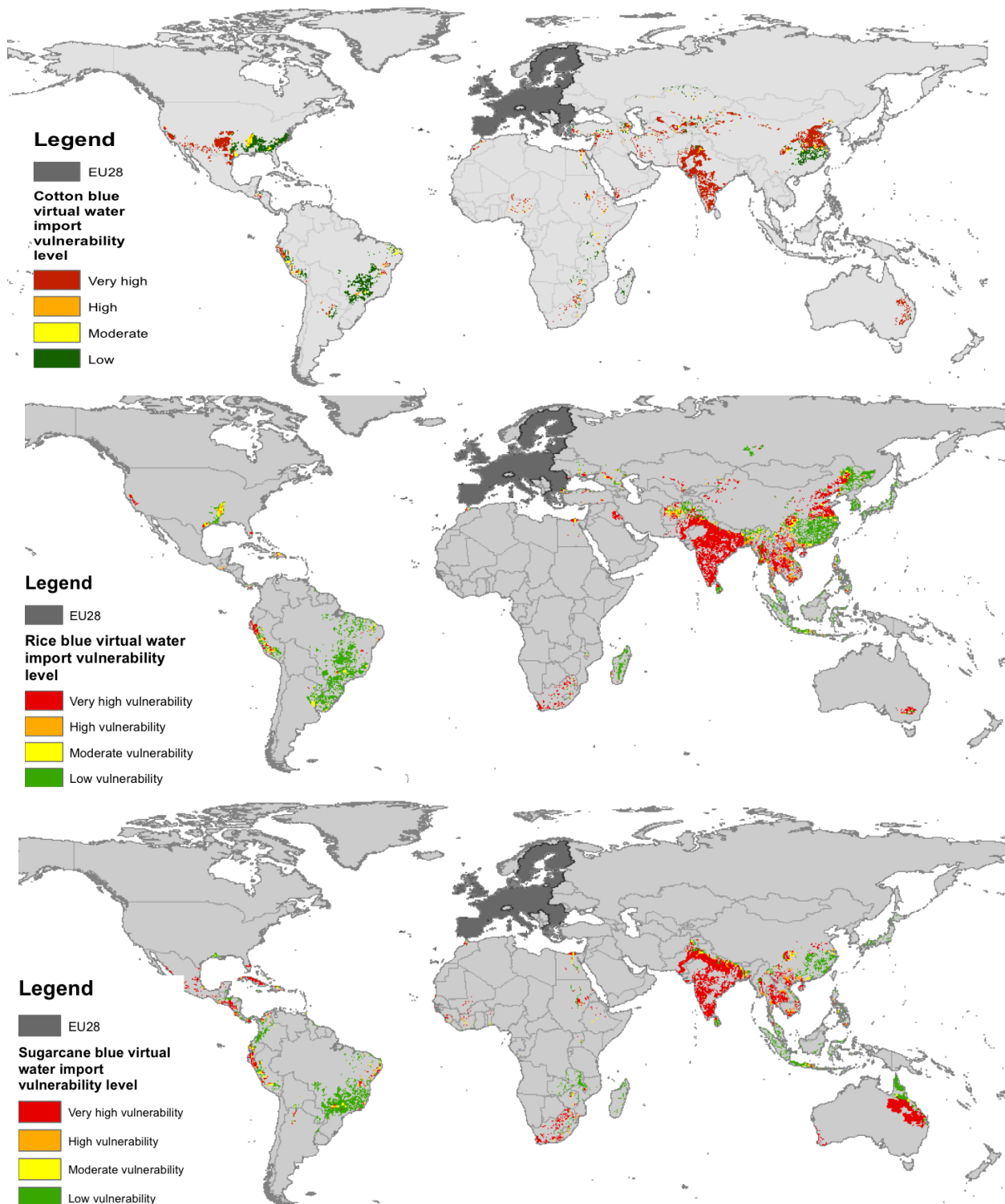


Figure 5.5. Vulnerability maps for blue virtual water imports to the EU for cotton, rice and sugar cane

Table 5.1 shows the vulnerability levels of the blue virtual water imports related to the key products per country of origin. For countries such as India, Pakistan and Mexico, almost all of the virtual water imports to the EU are sourced from locations with high blue water scarcity. For example, in the case of India and Pakistan, 93% and 91% respectively of the blue virtual water



imports related to rice are produced in locations with a “very high vulnerability”. This is also the case for cotton and sugar cane. In the USA, which produces soybeans under a variety of conditions, around 33% of blue virtual water imports are “highly vulnerable”.

Table 5.1. Vulnerability levels per country for blue virtual water imports to the EU for the key products

Crop	Country	Country share of total crop blue virtual water import	Vulnerability level and its percentage	
Soybean	United States	73%	Low	13%
			Moderate	26%
			High	28%
			Very High	33%
	Argentina	13%	Low	31%
			Moderate	16%
			High	2%
			Very High	51%
Rice	Pakistan	36%	Low	7%
			Moderate	1%
			High	1%
			Very High	91%
	Thailand	15%	Low	5%
			Moderate	2%
			High	8%
			Very High	85%
	India	14%	Low	2%
			Moderate	3%

			High	3%
			Very High	93%
	Egypt	10%	Low	0%
			Moderate	34%
			Very High	66%
	United States	10%	Low	16%
			Moderate	31%
			High	31%
			Very High	22%
	Uruguay	5%	Low	76%
			Moderate	24%
Sugarcane	Pakistan	20%	Low	9%
			High	1%
			Very High	90%
	India	13%	Low	3%
			High	2%
			Very High	96%
	Swaziland	12%	Low	76%
			Very High	24%
	Zimbabwe	8%	Low	46%
			High	16%
			Very High	38%
	Sudan	6%	Low	41%
			High	3%



			Very High	56%
	Zambia	6%	Low	100%
			Very High	0%
Cotton	Uzbekistan	18%	Low	5%
			Moderate	4%
			High	3%
			Very High	88%
	Turkey	16%	Low	9%
			Moderate	11%
			High	15%
			Very High	65%
	Tajikistan	13%	Low	48%
			Moderate	1%
			High	3%
			Very High	49%
	Kazakhstan	11%	Low	14%
			Moderate	6%
			High	15%
			Very High	65%
	Egypt	7%	Low	10%
			Moderate	33%
			Very High	57%
	Pakistan	5%	Low	5%
			Moderate	1%
			High	1%

			Very High	93%
Almonds	United States	96%	Low	2%
			Moderate	2%
			High	4%
			Very High	92%
	Australia	2%	Low	9%
			Moderate	4%
			High	2%
			Very High	86%
Pistachios	Iran	71%	Low	6%
			Moderate	3%
			High	5%
			Very High	86%
	United States	26%	Low	2%
			Moderate	2%
			High	4%
			Very High	93%
Grapes & wine	United States	31%	Low	29%
			Moderate	5%
			High	2%
			Very High	64%
	South Africa	24%	Low	6%
			Moderate	3%
			High	8%



			Very High	83%
	Australia	23%	Low	15%
			Moderate	1%
			High	1%
			Very High	83%
	Argentina	9%	Low	10%
			Moderate	17%
			High	1%
			Very High	71%

6 Discussion

6.1 Major advances of the study

Relative to the earlier study by Mekonnen and Hoekstra (2011), the current study advances the existing national water footprint assessment studies with respect to the following four key points:

1. The national water footprint accounts are prepared for all the countries in the world and synthesized for EU28 nations;
2. The study period is the most recent period (2006-2013) for which coherent and compatible sets of key data are available;
3. The national and EU water footprint accounts are prepared on an annual basis for the period 2006-2013; and
4. A vulnerability assessment framework is developed and applied for the European economy considering the potential effect of drought and water scarcity.

The existing study of national water footprint accounts from Mekonnen and Hoekstra (2011b) is averaged over the 10-year period of 1996-2005. The current study uses new international trade statistics (ITC 2010, 2016) in calculating the global virtual water flows between nations. It uses a new production database for crops and livestock for calculating the production water footprint in a country. The “Virtual Water Trade Model” developed for this study links global trade flows of all crop products, livestock products, and major industrial products to national production on an annual basis for the period of 2006-2013 for each component of the water footprint (green, blue and grey water footprint).

In the calculation of the water footprint of livestock, the water footprint of feed was separated by its origin, meaning that when part of the animal feed is imported, the water footprint of that part of the feed was allocated to the exporting country.

The current study calculates the water footprint of production similar to an earlier study by Mekonnen and Hoekstra (2011b). However, in the earlier study, the water footprint of consumption of agricultural products was calculated based on Food Balance Sheets from FAO averaged for the period of 1996-2005. Due to the difference in data sources, the water footprint of consumption calculated in the earlier study does not balance with the virtual water budget. In the current study, the water footprint of national consumption was calculated as the difference between the virtual water budget (water used for production plus virtual water imported) of a country and virtual water export from the country. Hence, the virtual water budget balances for all the nations globally.



6.2 Assumptions and limitations in data used

The various data sets used in the study, their source [reference] and limitations, as well as key assumptions used in the data processing, are presented in Table 6.1.

Table 6.1. Data sources, assumptions and limitations

Key data	Sources	Notes on assumptions and limitations
Crop production [tonne/year] and crop yield (tonne/ha)	(FAOSTAT data 2016a)	Only primary crops listed in FAO database are covered.
Livestock production [number of animals per country]	(FAOSTAT data 2016a)	National stock of animal numbers considered. A cross-check of the stock of swine and poultry with meat from these animals in the production database reveals significant gaps in the two databases.
Industrial water withdrawal		Limitations on the data availability in FAOSTAT. The list is not comprehensive as most of the countries do not have data for all the years. For countries where data are available for different years, a linear variation in the change in withdrawal has been assumed and extrapolated to find the data for a common year.
Domestic water withdrawal		Limitations on the data availability in FAOSTAT. For missing years, linear extrapolation in water withdrawal is made similar to data processing for industrial water withdrawal
Water footprint of primary crop products	Mekonnen and Hoekstra (2011)	The average water footprint of primary crop products for the period 1996-2005 is calculated using average climatic data for 30 years, average crop yield for 10 years (1996-2005), and average irrigation coverage for 1996-2005. Hence, any limitations in their studies due to average data used for these variables are implicitly carried into the current study as well.

Key data	Sources	Notes on assumptions and limitations
International trade of crop, livestock, and industrial products	(ITC 2010, 2016)	The data is processed into two common units: tonne/year for crop and livestock products, and US\$/year for industrial products. For the countries where the units of data were otherwise in the database, using the global average price (US\$/tonne) of that particular product and the total monetary value of the import (US\$/year) for that particular product in that country, units were harmonized. Such harmonization neglects the price variation of products across different countries over time.
Product fraction of crop and livestock products	(Chapagain and Hoekstra 2004, Mekonnen and Hoekstra 2011a)	The product fractions are assumed constant over time. For the additional derived products not covered in these two studies, expert estimates were made for the product fractions. A constant product fraction assumes no change in processing efficiency of primary crops and animals over time.
Value fraction of crop and livestock products	Calculated for the current period as an average over	The value fractions are updated using new market value of the products following methods from Hoekstra <i>et al.</i> (2011). However, similar to Mekonnen and Hoekstra (2011), the market value of the products are assumed to be constant over space and time over the new period, and are based on the global average price of the products traded internationally obtained from ITC database (ITC 2010, 2016).
Feed concentrate composition	(FAOSTAT data 2016b)	Limitations on the data availability in FAOSTAT.
Share of feed concentrate in total feed	(Hendy <i>et al.</i> 1995, Bouwman <i>et al.</i> 2005, Mekonnen and Hoekstra 2010c)	The underlying data are for the period before 2000 and need to be updated following developments in the last 20 years.



Key data	Sources	Notes on assumptions and limitations
Pastures	Mekonnen and Hoekstra (2010b)	Water footprint of pasture is assumed to be constant, and global average values are taken in the current study.
Animal weight and lifespan	(Mekonnen and Hoekstra, 2010b)	Assumed to be constant across countries, systems and years, and is for periods before 2000. This needs to be updated with new data when they become available.

6.3 Assumptions and limitations in water footprint accounting

6.3.1 Crop sector

The water footprint of crop products was updated primarily based on the change in yield from the average yield for the period 1996-2005. It was assumed that the change in yield [tonne per hectare] encompasses implicitly any changes in farming practices (including use of pesticides, fertilizers, irrigation, machineries etc.), climate change (favourable temperature, rainfall, humidity, sunshine hours, etc.), and other variables affecting the yield.

The calculation of crop water requirement in the earlier model developed by Mekonnen and Hoekstra (2011) used average climatic data for 30 years, average crop yield for 10 years (1996-2005), and average irrigation maps for the same period. Hence, any limitations in their studies are implicitly carried into the current study. A future improvement could be collecting the rolling climatic data in estimating evapotranspiration and subsequently using updated annual irrigation maps in separating the irrigation water use and green water use in the crop development stages. However, for a global study such as this, irrigation data availability per crop per country per year is still a challenge. Crop area distribution is obtained from Mekonnen, *et al.* (2010b), thus any changes in the crop area after that study period, either in location or in size, is not taken into account in the current study.

The grey water footprint for crops was only addressed by considering nitrogen use in agriculture. Neither phosphorus nor pesticides use is taken into account in the crop grey water footprint calculations. This results in lower grey water footprint values related to crops.

6.3.2 Livestock sector

In the calculation of the water footprint of livestock production, the following parameters were assumed to be constant over space or time, and taken to be equal to the global average values from different sources. The granularity of the study can be further improved with localized, time specific data when it becomes available:

- Animal live weight and life span over time and production systems;
- Share of production systems per country over time;
- Drinking and service water are constant for all countries and years;

- No separation between landraces and species, particularly buffalo and zebu cattle.

In addition to this, the study focused on a set of farming animals most commonly used in livestock production. Other species with local relevance, such as duck, turkey, camel, etc. were not considered. In the case of cattle production, the study used the same data for the calculation of buffalo and zebu cattle's water footprint as for *Bos taurus* cattle. Feed composition was based on Food Balance Sheets. As the starting point of the calculation was the water footprint of animal products, the total amount of feed production has not been adjusted to national production totals. When data for the production water footprint of a feed crop was not available, it was not considered as a part of the animal diet.

In the case of ruminants, all fodder has been considered as being pasture. Therefore, roughage such as green maize, clover, lucerne, etc. were not considered in the diet of animals. In addition to this, the water footprint of grass was taken as a single number without making a distinction between country, year or production system.

6.3.3 Domestic water sector

It was assumed that no change in the management and systems of water supply from the earlier period used in Mekonnen and Hoekstra has taken place, nor any changes in the coverage of the wastewater treatment for households from the baseline data reported in Mekonnen and Hoekstra (2011). Also, no distinction was made between rural and urban areas. Following Mekonnen and Hoekstra (2011), a fixed percentage of water abstraction was assumed to have been evaporated in the process of household water use. This assumption leads to a constant water footprint per capita per country. The total water footprint of the country in the domestic water supply changes only as a result of changes in the population of countries over time.

6.3.4 Industrial water withdrawal and pollution from industries

As the water footprint of industrial products in a country (m^3/USD) was calculated based on total water use by the industry (a top-down approach), it neither distinguishes the different industrial types and processes used, nor the differences in water use efficiencies/technologies used in the country. The current study assumes that there has been no change in the scale of industrial wastewater treatment over time.

The industrial water footprint per unit of product (m^3/USD) per country was updated with new industrial water withdrawal data. For years in which industrial water withdrawal data were not available, a linear variation/change in water withdrawal based on the historical trend was assumed. The broken time series on industrial water withdrawal (FAOSTAT data 2016a) was one of the challenges in refining the total industrial water footprint of a country.

6.3.5 Virtual water trade model

The virtual water import of a nation in relation to crops imported was calculated based on the average water footprint of the crop [m^3/tonne] in the exporting country. In practice, the export of a crop from a country may originate from different areas in the country with significantly different production variables. This could be particularly significant for large exporting countries such as the USA or France. Although the national average water footprint of crops or livestock products is used in estimating the virtual water flows, the distribution of total virtual water export was



based on the 5x5 arc minute gridded water footprint of production maps, as used by Mekonnen and Hoekstra (2011).

A major limitation of the study is that it calculates the virtual water import related to the import of products from the immediate trade partner only. Hence, if a product is a re-export of products originating from some other countries than the immediate trade partner, it cannot be traced back. In such cases, it is assumed that there is no external water footprint related to the import of the concerned crop products in those countries where the crop is not grown, as per the production data base of FAO (FAOSTAT data 2016a).

6.4 Assumptions and limitations in vulnerability assessment

The vulnerability assessment of virtual water import to the EU was considered based on existing trade (2006-2013), blue water scarcity (average 1996-2005) and drought severity. Hence, it is a snapshot in time, and it does not consider production shifting between regions as prices go up. In other words, it is not coupled to any production model which anticipates or projects the impact of climate change, demand or policy on the production of crops in a region. It does not consider resilience of regions to drought and does not take into account infrastructure, (e.g., salvation irrigation in rain-fed areas, or storage in conditions of water scarcity). The effect of irrigation on water scarcity is not considered in the analysis. The climate change effects, demand and production location changes will be addressed in the coming stages of the project, where output of other work packages of Imprex will be used to address these limitations.

7 Next steps

The current report presents the baseline assessment needed to perform the remaining tasks as described in the scope of WP12. These will be the next steps to achieve the overall goals of WP12:

- Refinements in data used and assumptions in the current study; and
- Further analysis on impact of climate change and weather extremes scenarios.

In the next stage of the project, the analysis presented in this report will be strengthened by improving the input datasets and model parameters used, and by addressing key limitations of the current study.

The water footprint of crops will be calculated by collecting recent climatic data in estimating evapotranspiration and subsequently using updated irrigation maps to separate the irrigation water use and green water use in the crop development stages. The water footprint of the livestock products will be accessed based on revised water footprint of feed and diet under updated climatic and production parameters. The trade database will be improved to address inconsistencies and with national or multi-national databases e.g. EUROSTAT, Pacific Institute etc.

In the next phase of the project, the assessment will be extended by incorporating climate change scenarios in terms of:

- **Changes in the water footprint of products:** The water footprint of a product (m^3/year) will change in the future; the change in climatic conditions will result in a change in the evaporative component of the water footprint of production. The next phase will address:
 - Effects of climate change on ET; and
 - Effects of change in production efficiency due to improved practices and technological advancement.
- **Changes in water availability:** Due to the impact of climate change on precipitation patterns, the availability of water resources, both on the temporal and spatial scale, will change.
- **Changes in the trade and production:** Population growth and economic growth will drive future demand. The demand will be met by either increased productivity of land and water or by importing (shifting supplies) from different regions supported by changes in national and regional policies on trade, resource uses, etc. The water dependency of EU countries and related economic implications under new virtual water fluxes will be assessed.
- **Refining the vulnerability assessment framework:** the current study uses only drought severity and blue water scarcity in the vulnerability assessment framework. The future study will include:
 - Water pollution level and updated blue water scarcity/green water scarcity indicators;
 - Changes in trade flows that can compensate for risks in other areas; and



- Impact on local water resources due to changes in virtual water flows and local water uses.

The results presented in this report will form the baseline for the next phase of the project. This will focus on the assessment of how different economic sectors in Europe will be affected due to dependencies on imports and water resources in other regions under climate change and hydrological extremes. The next step in this assessment will be to first understand how Europe's water demand will vary under different climatic conditions and the impacts of climate change on importing regions' water resources. This will then be used to elaborate the effects that different economic sectors in Europe may face due to dependencies on imports and water resources in other regions under climate change and hydrological extremes. The results will help governments, European policy-makers at all levels and companies in their mid- and long-term planning for sustainable development in light of climate change, population growth and increased demand for products and services.

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9 Appendices

9.1 Appendix A: Primary crop production in the EU28, average 2006-2013 (tonne/y)

Primary crops	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Germany
Almonds, with shell			361	716	537					1,080	
Anise, badian, fennel, coriander			31,782				48				
Apples	488,301	297,848	35,087	90,025	7,631	121,646	28,434	3,196	4,313	1,812,229	955,615
Apricots	14,258		11,729	1,329	1,194	3,132				152,498	323
Artichokes					2,544					46,571	
Asparagus	2,457	1,735	6,168			781	134		8	19,148	96,060
Avocados					995					26	
Bananas					6,327						
Barley	820,245	372,609	704,229	220,835	43,892	1,830,805	3,425,500	340,380	1,824,476	10,690,605	10,907,748
Beans, dry		629	2,776	2,117	204			191		6,949	
Beans, green	6,143	101,434	3,637	6,264	2,036	319	2		38	51,110	44,917
Berries nes	2,382	124	225	373		1,222		346	216		915
Blueberries			97				71			14,305	7,499
Broad beans, horse beans, dry	11,921	2,130	17		331	2,181				329,479	52,085
Buckwheat				304		2,065		201		111,719	
Cabbages and other brassicas	93,147	118,175	55,349	42,203	4,342	46,897	26,435	19,531	25,637	150,187	785,557
Canary seed						677					
Carobs				441	7,631						
Carrots and turnips	88,039	298,338	11,144	10,335	2,356	27,138	86,442	19,425	65,466	427,518	555,976
Cauliflowers and broccoli	6,895	92,612	2,675	3,534	1,780	5,829	5,970	258	3,980	356,663	157,625
Cereals, nes	316,406		1,453			10,130			2,463	116,349	
Cherries	40,187	6,000	23,088	6,729	488	2,227	235	114		46,445	30,756
Cherries, sour	5,226		3,952	7,247		6,396	8,919				22,201
Chestnut			429							8,401	
Chick peas			1,690		87						
Chicory roots		365,162		3,638						120,945	
Chillies and peppers, dry			1,107			2,514					

Primary crops	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Germany
Chillies and peppers, green	15,831	25,531	76,919	27,910	1,637	6,577			726	18,692	3,153
Cow peas, dry				335	171						
Cranberries			96								
Cucumbers and gherkins	40,728	20,294	59,947	13,367	13,313	18,199	18,266	9,948	43,593	134,154	240,754
Currants	18,737	1,688				2,581	11,642	654	1,827	14,017	10,927
Dates											
Eggplants (aubergines)	411	6,064	9,207		2,550					18,783	
Figs				2,062	3,391					3,011	
Flax fibre and tow	17	37,059	103			2,332		89		80,424	
Fruit, citrus nes					399						
Fruit, fresh nes			12,134		1,050	18,242				709	
Fruit, stone nes									13	9,884	5,674
Fruit, tropical fresh nes					80						
Garlic	384		1,778	4,634	163	964		164	23	19,529	
Gooseberries	1,856					2,843	214	119	53		79,083
Grain, mixed	30,124	4,135		6,254		6,972	37,360	8,076	50,863	218,068	111,439
Grapefruit (inc. pomelos)					24,542					4,275	
Grapes	322,148	156	298,624	193,732	32,539	74,451				6,044,259	1,222,469
Groundnuts, with shell			7,000		429						
Hazelnuts, with shell			59	1,519	39		6			7,679	
Hemp tow waste	2,808					617				1,188	
Hempseed										57,373	
Hops	380	355	215			6,001				973	33,238
Kiwi fruit			92		178					69,191	
Leeks, other alliaceous vegetables	5,758	171,138		5,923	24		5,651		519	166,097	99,766
Lemons and limes				327	14,230					3,970	
Lentils			1,752	71	10	2				17,000	
Lettuce and chicory	54,061	67,112	4,196	8,167	1,459	3,306	10,770		11,138	370,781	336,973
Linseed	1,611	8,322	179			3,407	42	133		30,739	7,675
Lupins	624									9,955	30,600
Maize	1,977,282	759,470	1,659,115	1,877,498		809,119	62,950			14,888,508	4,477,653

Primary crops	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Germany
Maize, green	11,810		45,770	501						412,498	
Melons, other (inc.cantaloupes)	478				10,669					279,335	
Melonseed											
Millet	9,272		4,483	386		1,831				37,888	
Mustard seed			1,104			19,007	28			9,477	8,967
Nuts, nes			1,286								
Oats	104,462	24,446	34,233	66,317	902	156,221	292,238	74,232	1,087,448	432,700	723,562
Oilseeds nes	13,792		16,898			1,068				14,179	
Okra					1,984						
Olives				35,655	15,190					26,572	
Onions, dry	136,668	72,588	14,343	28,126	6,864	38,910	54,052	1,829	21,552	192,202	417,318
Onions, shallots, green			6,616		77					53,476	68,903
Oranges				394	38,328					3,091	
Peaches and nectarines	6,093		23,499	7,919	3,827	2,723				314,058	827
Pears	104,435	267,450	1,450	8,122	1,190	4,727	14,090			167,955	43,508
Peas, dry	41,016	3,431	2,467	605		47,657	18,790	12,091	10,225	676,446	171,406
Peas, green	9,704	62,644	5,428	6,149	781	4,421	14,126	141	5,784	375,326	27,347
Peppermint			526								
Persimmons											
Pineapples											
Pistachios					25						
Plums and sloes	60,794	270	25,226	41,652	796	6,008	299	191		208,568	51,673
Poppy seed	1,654		589	2,318		27,996				6,453	2,992
Potatoes	694,966	3,245,524	261,353	219,569	110,342	712,946	1,573,222	150,418	645,087	6,878,407	10,879,409
Pulses, nes	6,143		411		85	9,697	6,211	31		7,903	8,256
Pumpkins, squash and gourds	15,847		6,506		3,680		1,874		1,462	137,082	85,478
Quinces		2,731	353	401	69					1,947	
Rapeseed	165,453	44,572	282,585	44,932		1,091,248	568,782	134,051	117,188	4,902,863	5,303,940
Raspberries	1,072	813	5,134	930		51	74	221	584	4,645	5,441
Rice, paddy			44,913							109,892	
Roots and tubers, nes								978			
Rye	186,204	2,463	17,916	3,453		150,025	264,388	39,808	59,600	134,141	3,425,830

Primary crops	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czech Republic	Denmark	Estonia	Finland	France	Germany
Safflower seed											
Seed cotton			608								
Sesame seed					1						
Sorghum	8,425		5,785	1,116						277,539	
Soybeans	79,019		489	124,556		14,342				106,460	2,875
Spices, nes			693								
Spinach	12,122	90,988	565		1,158	2,406	539		782	110,930	60,134
Strawberries	15,137	37,600	6,607	3,020	1,669	6,770	6,198	1,520	11,641	50,672	157,268
String beans										326,972	
Sugar beet	3,061,499	5,179,377	21,535	1,252,004		3,315,944	2,300,852		593,625	33,228,949	24,779,035
Sugar cane											
Sunflower seed	67,421		1,339,742	88,154		63,375				1,592,168	53,488
Sweet potatoes											
Tangerines, mandarins, clem- tines, satsumas				45,269	40,933					30,360	
Taro (cocoyam)					2,162						
Tea											
Tobacco, unmanufactured	352	179	40,066	11,307	128					15,336	6,714
Tomatoes	45,884	230,133	126,928	34,363	21,338	19,050	15,355	5,667	39,071	616,611	65,781
Triticale	215,878	40,948	24,284	42,731		198,480	153,154	15,164		1,920,330	2,282,436
Vegetables, fresh nes	48,077	537,199	40,395	15,961	7,217	36,265	27,607	14,777	31,850	934,703	449,914
Vegetables, leguminous nes	305		1,299		1,268	342				9,431	3,665
Vetches	2,744		447	2,133	80	93					
Walnuts, with shell	11,445	448	1,975	6,124	195	9,315				33,818	16,030
Watermelons	484		97,137	27,983	23,529					13,902	
Wheat	1,522,693	1,771,875	4,044,311	859,185	14,660	4,216,113	4,855,140	353,729	826,391	37,147,935	23,520,288
Yams											
Grand Total	181,485	326,677	129,142	94,759	7,742	230,641	362,222	38,491	166,292	1,592,225	1,720,355

Primary crops	Greece	Hungary	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Poland
Almonds, with shell	36,557	145		103,283						
Anise, badian, fennel, coriander	643	3,209				1,250			369	
Apples	253,049	480,617	47,750	2,215,171	18,519	60,704	4,252	54	360,625	2,391,898
Apricots	77,682	25,717		227,330				47		3,477
Artichokes	25,307			472,592		100		1,401		
Asparagus	14,779	4,893		37,928		519			15,000	2,218
Avocados	1,626									
Bananas	3,411			369						
Barley	319,166	1,076,730	1,292,627	1,068,641	272,050	790,434	45,469	2,088	246,458	3,592,336
Beans, dry	20,318	1,154	13,475	12,230	3,900	6,187	152	363	4,099	31,725
Beans, green	64,295	21,961	1,496	177,732		574	40		51,750	3,015
Berries nes	1,035		200	81,925	306	842		162	1,228	48,658
Blueberries				1,409	419	3,295			5,102	8,852
Broad beans, horse beans, dry	2,856	358		92,693		1,637	155	768	1,882	286
Buckwheat		352			7,988	20,538				82,981
Cabbages and other brassicas	182,372	89,498	51,467	330,684	58,267	95,358	79	3,587	275,825	1,223,622
Canary seed		5,616								
Carobs	17,475			28,813						
Carrots and turnips	47,385	81,541	31,171	538,740	34,359	57,809	422	1,237	521,250	841,368
Cauliflowers and broccoli	78,596	18,958	9,412	408,726	1,539	2,138	30	6,233	57,650	281,541
Cereals, nes	4,230	2,212	4,275	63,362		825	185			10,852
Cherries	52,954	6,824		116,484	378	1,603	47		465	39,576
Cherries, sour	1,601	58,748		7,232						172,423
Chestnut	19,655	343		51,111	50					
Chick peas	3,409	43		8,365						
Chicory roots									56,438	35,783
Chillies and peppers, dry	412	19,702								

Primary crops	Greece	Hungary	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Poland
Chillies and peppers, green	138,154	148,525		271,682					346,100	
Cow peas, dry		9								
Cranberries					1,644					
Cucumbers and gherkins	141,837	44,678	1,591	54,361	7,921	14,283	38	763	426,458	496,509
Currants		5,392	139	722	1,217				3,157	185,677
Dates										
Eggplants (aubergines)	72,882	3,075		286,956		2,269		731	44,633	
Figs	14,373			14,257				184		
Flax fibre and tow				1,650	630	109			13,441	374
Fruit, citrus nes	1,064			31,283				468		
Fruit, fresh nes	14,430	16,179	8,272	59,633	141			492		44,770
Fruit, stone nes	2,986	14,193		6,772		426		222		10,336
Fruit, tropical fresh nes										
Garlic	10,271	5,545		28,282	319	2,167		574		
Gooseberries		1,244			100	299				15,248
Grain, mixed	3,038				17,937	38,700	1,101			3,445,918
Grapefruit (inc. pome- los)	8,766			7,320				10		
Grapes	960,762	472,298		7,602,140			15,848	4,684	979	
Groundnuts, with shell	1,769	10								
Hazelnuts, with shell	1,485	101		113,233						3,463
Hemp tow waste		500		950					5,445	50
Hempseed		538								28
Hops			43							2,888
Kiwi fruit	115,814			431,631						
Leeks, other alliaceous vegetables	37,834	2,026		11,870	400	566	37	225	99,500	115,650
Lemons and limes	69,029			485,075				546		
Lentils	4,086	132		1,555						

Primary crops	Greece	Hungary	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Poland
Lettuce and chicory	108,693	7,929	6,625	862,890	186		186	3,915	85,350	23,870
Linseed		952		2,000	437	300			2,103	2,084
Lupins	455	264		5,362	87	6,600				70,713
Maize	2,241,509	6,894,855		8,902,723		51,487	2,244		210,870	2,334,738
Maize, green		463,821								20,774
Melons, other (inc.can- taloupes)	135,104	12,036		582,468				3,927	2,520	
Melonseed	4,965									
Millet		9,975								18,802
Mustard seed		4,845				853				
Nuts, nes				1,952						
Oats	114,177	135,591	161,225	319,100	124,676	127,025	5,608		8,864	1,318,597
Oilseeds nes		5,810			2,076	2,560				23,038
Okra										
Olives	2,253,277			3,217,076				5		
Onions, dry	205,066	63,783	9,749	377,591	17,547	22,167	77	7,483	1,254,737	639,608
Onions, shallots, green	25,146	1,660							36,138	
Oranges	844,348			2,225,524				1,211		
Peaches and nectarines	764,506	46,853		1,567,122				1,125		8,912
Pears	70,268	22,389		805,044	587	2,002	591	66	260,625	61,946
Peas, dry	681	43,153	4,420	29,434	2,375	38,550	718		3,669	32,854
Peas, green	11,153	91,405	2,698	85,276	156	678	12	138	26,825	34,062
Peppermint										
Persimmons				50,041						
Pineapples										
Pistachios	9,273			2,645						
Plums and sloes	13,894	50,409		189,271	313	1,824	236		5,048	95,234
Poppy seed		4,704							642	
Potatoes	859,156	555,883	366,588	1,598,134	480,050	556,638	19,446	15,183	6,841,648	9,285,367
Pulses, nes	2,996	460		4,167	50	14,850	47		-	179,724

Primary crops	Greece	Hungary	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Poland
Pumpkins, squash and gourds	81,417	17,394		521,146	3,617	563		1,542	16,312	49,748
Quinces	4,428	922		981	122	158				
Rapeseed	7,125	507,804	36,150	32,934	220,773	414,004	16,405		10,111	2,127,224
Raspberries		4,825	173	1,877	182	1,686	1		1,264	91,402
Rice, paddy	217,224	9,288		1,501,204						
Roots and tubers, nes										
Rye	39,127	88,196	483	12,343	123,626	136,600	6,007		9,216	3,081,164
Safflower seed		85								
Seed cotton	883,094									
Sesame seed	52			1,751						
Sorghum	565	11,515		241,772						
Soybeans	3,353	76,936		492,233						459
Spices, nes		849								
Spinach	51,053	3,708		87,694		76		249	34,375	
Strawberries	35,027	5,146	1,590	112,919	1,202	4,031	22	606	44,725	178,779
String beans										63,092
Sugar beet	965,143	1,125,617	-	3,502,293	242,350	761,588			5,559,113	11,118,898
Sugar cane										
Sunflower seed	93,743	1,263,850		222,237						4,979
Sweet potatoes	3,614			9,320						
Tangerines, mandarins, clementines, satsumas	111,059			769,277				91		
Taro (cocoyam)										
Tea										
Tobacco, unmanufactured	26,034	8,671		82,081						37,116
Tomatoes	1,316,111	171,886	7,168	5,971,985	6,692	5,834	96	13,821	783,165	701,484
Triticale	13,350	400,163			32,725	307,376	22,671		15,407	4,214,340
Vegetables, fresh nes	77,281	88,513	35,399	2,130,365	30,710	82,603		28,360	320,915	824,965

Primary crops	Greece	Hungary	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Poland
Vegetables, leguminous nes	8,793			54,134		108		2,786	5,538	10,437
Vetches	10,512	36		8,794	69	2,775		670		4,491
Walnuts, with shell	22,102	4,453		11,703			64			9,579
Watermelons	609,745	185,562		427,698				4,084		
Wheat	1,779,489	4,400,583	756,051	7,251,263	1,047,352	1,934,096	83,163	13,937	1,269,066	8,920,319
Yams										
Grand Total	207,299	250,802	109,475	739,678	61,346	110,197	7,575	3,101	406,217	950,215

Primary crops	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	United Kingdom	Grand Total
Almonds, with shell	8,045				217,896			40,958
Anise, badian, fennel, coriander		7,573	145		2,277			5,255
Apples	246,527	521,482	35,499	100,362	622,419	22,723	235,046	409,322
Apricots	3,379	30,737	1,595	539	108,377			39,020
Artichokes		966			199,485			93,621
Asparagus			1,007	143	48,710		3,926	14,707
Avocados	16,398				79,308			19,671
Bananas	27,851				363,198			80,231
Barley	57,454	1,108,154	583,891	73,830	8,910,468	1,523,161	5,745,212	2,067,482
Beans, dry	2,735	22,292	233	481	11,584	918		6,578
Beans, green	16,410	55,973	1,046	2,668	186,484		15,703	34,682
Berries nes		2,514	99	158	6,063	1,572	6,261	7,129
Blueberries		2,287				2,698		4,381
Broad beans, horse beans, dry	18,701		921	9	34,275		124,000	35,151
Buckwheat			209	993				22,735
Cabbages and other brassicas	164,426	1,018,016	56,875	23,278	217,627	17,600	279,200	194,830
Canary seed					16			2,103
Carobs	21,994				50,107			21,077
Carrots and turnips	152,768	223,841	34,917	2,939	426,904	106,196	713,576	193,891
Cauliflowers and broccoli	42,957	32,993	9,917	1,343	465,051	7,123	180,187	81,535
Cereals, nes		2,942	1,234	1,043				32,365
Cherries	11,617	76,080	1,929	3,637	88,748	552	1,574	22,350
Cherries, sour	710		581	409	2,900			21,325
Chestnut	23,474	27		22	14,305			12,083
Chick peas	703	280	225		25,353			4,462
Chicory roots			117		1,072			90,764
Chillies and peppers, dry		39,956		1,032	4,446			9,881
Chillies and peppers, green	1,327	235,021	24,924	3,873	977,785		18,818	123,326
Cow peas, dry								204
Cranberries		387						709
Cucumbers and gherkins	8,502	165,328	27,994	3,613	665,554	33,306	58,328	100,953

Primary crops	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	United Kingdom	Grand Total
Currants		41	213	5		458	14,350	14,487
Dates					4,285			4,285
Eggplants (aubergines)	6,225	143,248			201,502			57,038
Figs	17,355			27	28,143			9,200
Flax fibre and tow		238	55		8		15,451	11,732
Fruit, citrus nes					14,777			9,598
Fruit, fresh nes	5,873	55,559	46,252		165,641			30,967
Fruit, stone nes	4,846							5,366
Fruit, tropical fresh nes					52,321			26,200
Garlic	1,809	63,136	2,272	390	148,821			15,328
Gooseberries			52				2,422	8,628
Grain, mixed				2,963	24,983	62,800	21,138	230,002
Grapefruit (inc. pomelos)	2,136				47,265			13,474
Grapes	841,868	891,174	46,350	104,655	5,998,543		1,095	1,256,439
Groundnuts, with shell	29				127			1,561
Hazelnuts, with shell	346	35		106	17,267			11,180
Hemp tow waste		2,925			22			1,686
Hempseed		115			8			12,553
Hops	128	251	255	1,992	992		1,580	3,521
Kiwi fruit	20,148			220	20,399			83,513
Leeks, other alliaceous vegetables		1,291	95	640	81,963	4,125	41,330	37,404
Lemons and limes	12,441				685,569			158,898
Lentils			459		20,664			5,011
Lettuce and chicory	104,666	3,203	2,658	14,042	906,232	27,416	127,746	121,291
Linseed		1,760	1,923		7,572	13,925	50,287	7,129
Lupins	9		370		4,414			12,318
Maize	697,927	8,305,293	1,046,279	296,375	3,852,939			3,144,480
Maize, green		11,163	10,526					130,518
Melons, other (inc.cantaloupes)	22,953	52,508	851		979,598			173,537
Melonseed								4,965
Millet		4,349	1,348	289	690			8,119

Primary crops	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	United Kingdom	Grand Total
Mustard seed		5,643	1,483					5,712
Nuts, nes	2,749			96	4,867			2,190
Oats	64,080	333,688	34,160	4,940	1,020,247	739,052	732,070	305,180
Oilseeds nes			1,437					9,117
Okra								1,984
Olives	415,289			1,699	6,573,613			1,393,153
Onions, dry	120,045	373,750	27,028	5,524	1,171,448	37,688	351,950	202,489
Onions, shallots, green	3,712				40,152		16,369	25,225
Oranges	205,024				3,062,539			797,557
Peaches and nectarines	37,004	17,281	2,780	8,363	1,258,712			239,506
Pears	176,704	61,547	1,862	10,299	495,046	1,983	25,328	104,369
Peas, dry		39,225	13,831	3,074	181,874	42,463	119,025	61,579
Peas, green	7,881	22,439	3,468	206	81,618	40,039	298,254	43,506
Peppermint					123			278
Persimmons				618				25,329
Pineapples	3,120							3,120
Pistachios								3,981
Plums and sloes	17,237	514,421	5,582	5,696	204,304	415	13,739	60,758
Poppy seed		1,962	766		7,150			5,255
Potatoes	494,875	3,562,078	210,678	97,571	2,376,150	823,463	5,812,252	2,118,800
Pulses, nes		511	2,121	244	25,803		393,523	34,176
Pumpkins, squash and gourds	13,491	75,607	14,515		386,545			75,465
Quinces	4,315	6,466		29	12,526			2,736
Rapeseed		535,599	329,135	12,725	44,588	271,200	2,194,504	776,636
Raspberries		602	27		10,616	407	14,968	6,533
Rice, paddy	165,119	49,954			826,839			365,554
Roots and tubers, nes				25,368	7,554			10,021
Rye	19,638	28,552	54,305	2,873	269,411	145,775	35,930	320,657
Safflower seed					40			62
Seed cotton					130,170			337,957
Sesame seed								602

Primary crops	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	United Kingdom	Grand Total
Sorghum		22,943	997		33,638			63,167
Soybeans		150,337	25,095	324	1,508			77,688
Spices, nes					3,486			1,676
Spinach	16,142	2,428	1,623	270	61,079			27,592
Strawberries	7,806	20,080	1,107	1,982	286,128	12,674	96,847	39,599
String beans								195,032
Sugar beet	93,938	833,987	996,573	262,031	4,078,009	2,209,824	7,622,873	5,430,259
Sugar cane	5,162				2,495			3,918
Sunflower seed	11,584	1,379,472	185,642	497	845,373			480,782
Sweet potatoes	22,201				23,200			14,584
Tangerines, mandarins, clementines, satsumas	44,398				2,138,608			397,499
Taro (cocoyam)								2,162
Tea	130							130
Tobacco, unmanufactured	1,020	1,872	137		32,633			18,483
Tomatoes	1,312,487	769,706	50,941	5,193	4,079,584	15,058	87,758	589,970
Triticale	31,548	124,750	34,845	13,395	185,752	197,100	62,000	478,218
Vegetables, fresh nes	637,055	27,137	19,445	8,408	546,889	26,939	288,576	271,019
Vegetables, leguminous nes	31,724	590	191		65,494	13,541	19,209	12,885
Vetches			122		48,174			5,881
Walnuts, with shell	4,034	33,290	1,171	3,226	12,404			10,076
Watermelons	3,832	542,816	3,920		798,315			210,693
Wheat	125,133	5,803,029	1,481,957	149,793	6,070,089	2,157,141	14,291,930	4,880,954
Yams	2,189							2,189
Grand Total	99,114	421,847	82,892	19,133	688,915	267,479	1,003,358	410,029

9.2 Appendix B: Water footprint of domestic (household) water sector in the EU28 (Mm³/y)

	Blue Water Footprint								Grey Water Footprint								Average WF		Total WF
country	2006	2007	2008	2009	2010	2011	2012	2013	2006	2007	2008	2009	2010	2011	2012	2013	Blue WF	Grey WF	Mm3/y
Austria	75.6	75.9	76.2	76.5	76.8	77.0	77.3	77.6	267.5	268.6	269.5	270.5	271.5	272.5	273.5	274.6	76.6	271.0	347.7
Belgium	75.9	76.4	77.0	77.5	78.1	78.6	79.1	79.6	286.2	288.1	290.1	292.1	294.2	296.2	298.2	300.2	77.8	293.2	370.9
Bulgaria	105.8	105.0	104.2	103.5	102.7	102.0	101.3	100.6	675.9	670.9	666.1	661.3	656.6	652.0	647.5	642.9	103.1	659.2	762.3
Croatia	30.4	30.3	30.2	30.1	30.0	29.9	29.8	29.7	162.9	162.5	162.0	161.5	161.0	160.4	159.9	159.3	30.0	161.2	191.2
Cyprus	7.4	7.5	7.6	7.7	7.8	7.9	8.0	8.1	53.1	53.8	54.5	55.2	55.9	56.5	57.1	57.8	7.8	55.5	63.2
Czech Re- public	105.1	105.7	106.4	107.0	107.5	107.8	107.9	107.9	400.3	402.6	405.2	407.6	409.4	410.5	410.9	410.9	106.9	407.2	514.1
Denmark	41.8	42.0	42.2	42.4	42.6	42.8	43.0	43.2	94.2	94.7	95.2	95.7	96.1	96.6	97.0	97.4	42.5	95.9	138.3
Estonia	8.7	8.7	8.7	8.6	8.6	8.6	8.6	8.5	37.6	37.5	37.4	37.3	37.1	37.0	36.9	36.8	8.6	37.2	45.8
Finland	34.5	34.7	34.9	35.0	35.2	35.4	35.6	35.8	156.0	156.6	157.4	158.2	159.0	159.8	160.6	161.5	35.1	158.6	193.8
France	648.3	652.0	655.7	659.1	662.5	665.7	668.8	671.8	2,293.1	2,306.3	2,319.1	2,331.5	2,343.4	2,354.8	2,365.7	2,376.3	660.5	2,336.3	2,996.8
Germany	576.1	574.6	573.3	572.3	571.7	571.6	572.0	572.6	1,618.2	1,614.2	1,610.4	1,607.5	1,605.8	1,605.6	1,606.6	1,608.4	573.0	1,609.6	2,182.6
Greece	128.8	129.2	129.6	129.8	129.8	129.5	129.0	128.3	570.0	571.7	573.3	574.2	574.1	572.8	570.6	567.8	129.3	571.8	701.0
Hungary	70.1	70.0	69.9	69.8	69.6	69.4	69.2	69.0	375.9	375.3	374.8	374.2	373.5	372.5	371.4	370.1	69.6	373.5	443.1
Ireland	28.6	29.3	29.9	30.4	30.8	31.0	31.1	31.2	129.3	132.1	134.9	137.3	139.0	140.1	140.6	140.7	30.3	136.7	167.0
Italy	826.4	829.5	832.0	834.1	835.8	837.1	837.9	838.4	3,985.4	4,000.3	4,012.5	4,022.5	4,030.7	4,036.9	4,040.8	4,043.1	833.9	4,021.5	4,855.4
Latvia	15.0	14.8	14.6	14.4	14.2	14.0	13.9	13.7	73.2	72.3	71.4	70.5	69.6	68.7	67.8	67.0	14.3	70.0	84.4
Lithuania	20.0	19.7	19.5	19.2	18.9	18.6	18.2	17.9	95.6	94.4	93.1	91.7	90.3	88.8	87.2	85.7	19.0	90.9	109.8
Luxem- bourg	2.6	2.7	2.7	2.8	2.9	2.9	3.0	3.1	3.4	3.5	3.6	3.7	3.8	3.8	3.9	4.0	2.8	3.7	6.6
Malta	4.1	4.2	4.2	4.2	4.3	4.3	4.3	4.3	32.7	33.0	33.2	33.5	33.7	33.9	34.0	34.1	4.2	33.5	37.7
Nether- lands	50.4	50.6	50.8	50.9	51.1	51.3	51.5	51.7	107.4	107.8	108.2	108.5	108.9	109.3	109.7	110.1	51.0	108.7	159.8
Poland	209.9	210.0	210.1	210.3	210.4	210.5	210.6	210.6	1,167.0	1,167.7	1,168.4	1,169.2	1,169.9	1,170.5	1,171.0	1,171.2	210.3	1,169.4	1,379.7
Portugal	110.3	110.6	110.9	111.0	111.0	110.7	110.3	109.7	623.0	625.0	626.6	627.4	627.0	625.5	622.9	619.6	110.6	624.6	735.2
Romania	162.3	160.5	158.7	156.9	155.3	153.9	152.6	151.5	1,241.4	1,228.1	1,214.2	1,200.6	1,188.3	1,177.3	1,167.5	1,158.7	156.5	1,197.0	1,353.5

	Blue Water Footprint								Grey Water Footprint								Average WF		Total WF
country	2006	2007	2008	2009	2010	2011	2012	2013	2006	2007	2008	2009	2010	2011	2012	2013	Blue WF	Grey WF	Mm3/y
Slovakia	42.9	42.9	42.9	43.0	43.0	43.0	43.1	43.1	262.0	262.1	262.4	262.6	262.9	263.1	263.3	263.5	43.0	262.7	305.7
Slovenia	20.2	20.3	20.5	20.6	20.7	20.8	20.8	20.8	135.2	136.0	136.9	137.7	138.3	138.8	139.0	139.2	20.6	137.6	158.2
Spain	515.7	523.4	530.5	536.0	539.6	540.8	540.0	537.9	1,099.1	1,115.6	1,130.6	1,142.4	1,150.0	1,152.6	1,150.9	1,146.4	533.0	1,135.9	1,668.9
Sweden	111.2	112.0	112.9	113.9	114.8	115.8	116.8	117.8	277.1	279.2	281.4	283.7	286.1	288.6	291.1	293.5	114.4	285.1	399.5
United Kingdom	212.7	214.4	216.3	218.2	219.9	221.5	222.9	224.3	249.4	251.5	253.7	255.9	257.9	259.8	261.4	263.0	218.8	256.6	475.4
	4,240.8	4,257.1	4,272.3	4,285.3	4,295.6	4,302.6	4,306.6	4,308.6	16,471.9	16,511.3	16,546.0	16,573.9	16,594.0	16,604.9	16,607.2	16,603.7	4,283.6	16,564.1	20,847.7

9.3 Appendix C: Production water footprint of agriculture sector in the EU28 (Mm³/y)

Country	Blue WF of agricultural production [Mm3/y]									Green WF of agricultural production [Mm3/y]									Grey WF of agricultural production [Mm3/y]									Total [green + blue + grey] WF
	2006	2007	2008	2009	2010	2011	2012	2013	Average	2006	2007	2008	2009	2010	2011	2012	2013	Average	2006	2007	2008	2009	2010	2011	2012	2013	Average	
Austria	136	138	136	136	146	163	163	150	146	4,684	4,767	4,861	4,842	5,027	5,288	5,298	5,029	4,975	595	604	622	619	630	641	641	615	621	5,742
Belgium	54	54	54	55	57	52	52	50	54	2,864	2,851	2,834	2,819	3,019	2,815	2,763	2,763	2,841	577	579	582	580	593	581	580	572	580	3,475
Bulgaria	128	121	115	113	132	135	133	130	126	10,690	10,273	11,272	11,608	11,805	11,961	12,217	12,672	11,562	1,096	1,217	1,253	1,404	1,288	1,276	1,329	1,471	1,292	12,980
Croatia	22	22	21	20	17	18	17	16	19	3,881	3,832	3,824	3,805	3,599	3,587	3,698	3,706	3,742	572	558	574	567	538	538	553	562	558	4,319
Cyprus	255	262	189	206	166	168	161	154	195	375	324	278	270	262	277	272	247	288	32	30	25	25	25	28	26	23	27	510
Czech Rep	52	50	48	45	44	44	42	43	46	7,554	7,709	7,653	7,669	7,534	7,614	7,593	7,525	7,606	1,864	1,968	1,984	1,994	1,981	2,008	2,023	2,050	1,984	9,636
Denmark	104	106	103	107	109	110	104	101	105	6,131	6,238	6,248	6,307	6,374	6,293	6,028	5,964	6,198	1,076	1,077	1,082	1,109	1,114	1,105	1,051	1,026	1,080	7,383
Estonia	10	9	9	8	8	8	8	8	9	1,286	1,332	1,373	1,428	1,376	1,421	1,378	1,460	1,382	158	165	173	181	175	185	177	187	175	1,565
Finland	34	32	32	32	32	31	31	31	32	3,576	3,453	3,473	3,409	3,313	3,297	3,130	3,241	3,362	110	106	109	106	96	99	94	99	102	3,496
France	2,482	2,473	2,629	2,657	2,592	2,739	2,655	2,750	2,622	63,961	64,243	65,709	65,051	66,904	65,112	64,714	64,642	65,042	6,341	6,400	6,775	6,875	6,576	6,627	6,847	6,988	6,679	74,343
Germany	553	551	553	554	547	553	551	552	552	40,469	40,126	41,204	41,185	40,285	39,421	38,906	39,321	40,115	10,318	10,210	10,597	10,553	10,189	9,999	9,936	10,011	10,227	50,893
Greece	3,757	3,681	3,192	3,198	3,029	3,321	3,400	3,303	3,360	10,254	10,064	9,711	9,871	9,082	9,765	10,286	10,191	9,903	966	947	901	927	776	817	881	878	886	14,149
Hungary	171	174	175	170	156	155	155	158	164	14,294	14,190	14,750	14,682	13,561	14,096	14,221	14,532	14,291	2,858	2,893	2,962	2,945	2,658	2,716	3,014	2,989	2,879	17,335
Ireland	88	88	88	88	88	88	88	96	89	5,913	5,750	6,014	5,914	5,652	5,615	5,874	5,896	5,829	170	171	200	184	170	187	199	187	184	6,101
Italy	4,320	4,285	4,181	4,165	4,179	4,159	3,943	3,913	4,143	34,018	34,678	35,137	33,337	33,143	32,375	31,901	32,261	33,356	4,912	5,008	4,997	4,598	4,551	4,535	4,430	4,385	4,677	42,176
Latvia	16	15	15	14	14	14	14	14	14	2,370	2,330	2,353	2,357	2,416	2,484	2,562	2,694	2,446	303	307	300	306	319	331	329	349	318	2,778
Lithuania	36	35	35	33	32	31	30	29	33	4,703	4,824	4,743	5,215	5,224	5,435	5,764	5,946	5,232	94	97	100	115	111	117	129	134	112	5,377
Luxembourg	3	3	3	3	3	3	3	3	3	139	142	146	140	141	137	134	138	140	27	27	25	21	21	20	20	20	22	165
Malta	10	7	9	9	9	8	8	8	9	36	33	36	34	34	33	33	33	34	3	3	3	3	3	3	3	3	3	46
Netherlands	151	159	167	166	167	159	157	166	162	3,236	3,243	3,310	3,297	3,293	3,239	3,180	3,270	3,259	601	600	615	604	607	606	588	601	603	4,023
Poland	305	292	292	282	262	270	263	267	279	41,664	41,956	42,375	41,821	39,822	38,862	38,361	38,083	40,368	6,386	6,061	6,317	6,323	6,485	6,151	6,280	6,461	6,308	46,955
Portugal	1,340	1,329	1,358	1,239	1,207	1,304	1,287	1,291	1,294	7,149	6,568	6,734	6,497	6,302	6,289	6,341	6,367	6,531	449	408	431	395	372	375	375	381	398	8,223
Romania	1,006	867	840	833	829	859	884	872	874	29,675	27,947	29,862	30,026	29,689	30,139	29,958	30,513	29,726	1,530	1,469	1,553	1,620	1,607	1,579	1,548	1,574	1,560	32,160

Country	Blue WF of agricultural production [Mm3/y]									Green WF of agricultural production [Mm3/y]									Grey WF of agricultural production [Mm3/y]									Total [green + blue + grey] WF
	2006	2007	2008	2009	2010	2011	2012	2013	Average	2006	2007	2008	2009	2010	2011	2012	2013	Average	2006	2007	2008	2009	2010	2011	2012	2013	Average	
Slovakia	155	146	139	134	140	149	151	152	146	4,434	4,437	4,465	4,428	4,163	4,358	4,409	4,390	4,386	563	549	565	567	541	575	588	586	567	5,098
Slovenia	29	29	25	25	31	31	31	47	31	1,726	1,738	1,548	1,512	1,863	1,865	1,880	2,706	1,855	643	658	599	585	649	638	653	821	656	2,542
Spain	12,785	12,657	12,569	12,818	12,481	12,859	12,675	12,867	12,714	49,879	49,549	50,548	48,905	48,582	48,881	48,966	49,077	49,298	7,167	7,069	7,364	6,842	6,718	6,707	6,812	6,880	6,945	68,957
Sweden	51	49	48	47	46	46	46	45	47	3,986	3,970	4,159	4,152	4,032	4,042	4,010	3,959	4,039	677	684	730	720	691	711	704	688	701	4,787
United Kingdom	266	265	259	260	257	253	254	250	258	20,624	20,525	21,118	20,366	20,753	20,865	21,118	20,326	20,712	3,604	3,695	4,013	3,701	3,803	3,917	4,017	3,692	3,805	24,775
Total Eu28	28,320	27,900	27,285	27,419	26,779	27,732	27,306	27,467	27,526	379,570	377,093	385,739	380,947	377,249	375,569	374,996	376,954	378,515	53,695	53,559	55,452	54,470	53,286	53,073	53,829	54,233	53,950	459,990

9.4 Appendix D: Production water footprint of industrial sector in the EU28 (Mm³/y)

Country	Blue WF of industrial production [Mm3/y]									Grey WF of industrial production [Mm3/y]									Total WF [Blue+Grey]
	2006	2007	2008	2009	2010	2011	2012	2013	Average	2006	2007	2008	2009	2010	2011	2012	2013	Average	
Austria	66.4	65.2	64.1	63.0	61.8	60.7	59.6	58.4	62.4	100.9	99.2	97.4	95.7	94.0	92.3	90.5	88.8	94.8	157.2
Belgium	300.6	295.4	290.3	285.1	280.0	274.9	269.7	264.6	282.6	2284.3	2245.2	2206.1	2167.1	2128.0	2088.9	2049.9	2010.8	2147.5	2,430.1
Bulgaria	229.3	229.0	228.7	228.4	228.1	227.7	227.4	227.1	228.2	2527.2	2523.7	2520.2	2516.7	2513.3	2509.8	2506.3	2502.8	2515.0	2,743.2
Croatia	3.5	3.9	4.4	4.8	5.2	5.6	6.1	6.5	5.0	47.6	53.4	59.1	64.9	70.7	76.4	82.2	88.0	67.8	72.8
Cyprus	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.3	2.8	3.2	3.6	4.0	4.5	4.9	5.3	5.7	4.3	4.6
Czech Rep	81.9	90.3	98.7	107.1	115.6	124.0	132.4	140.8	111.4	342.4	377.5	412.7	447.9	483.0	518.2	553.3	588.5	465.4	576.8
Denmark	16.3	16.7	17.0	17.3	17.7	18.0	18.3	18.6	17.5	37.5	38.3	39.1	39.8	40.6	41.3	42.1	42.9	40.2	57.7
Estonia	4.0	5.1	6.1	7.1	8.2	9.2	10.2	11.3	7.7	19.2	24.1	29.0	33.9	38.8	43.7	48.6	53.6	36.4	44.0
Finland	105.7	107.9	110.1	112.3	114.6	116.8	119.0	121.2	113.4	381.6	389.6	397.6	405.5	413.5	421.5	429.5	437.5	409.5	523.0
France	1485.5	1483.0	1480.5	1478.0	1475.5	1473.0	1470.5	1468.0	1476.8	5644.9	5635.4	5625.9	5616.4	5606.9	5597.4	5587.9	5578.4	5611.7	7,088.4
Germany	1553.2	1509.8	1466.5	1423.2	1379.8	1336.5	1293.2	1249.8	1401.5	1770.6	1721.2	1671.8	1622.4	1573.0	1523.6	1474.2	1424.8	1597.7	2,999.2
Greece	13.0	13.4	13.9	14.3	14.8	15.2	15.7	16.2	14.6	36.9	38.2	39.5	40.8	42.2	43.5	44.8	46.1	41.5	56.1
Hungary	223.0	222.0	221.1	220.1	219.1	218.1	217.1	216.2	219.6	1610.2	1603.1	1596.1	1589.0	1581.9	1574.8	1567.8	1560.7	1585.4	1,805.0
Ireland	41.7	39.8	38.0	36.2	34.3	32.5	30.7	28.9	35.3	126.7	121.1	115.5	110.0	104.4	98.8	93.3	87.7	107.2	142.5
Italy	833.5	852.4	871.4	890.3	909.3	928.2	947.2	966.1	899.8	4909.0	5020.6	5132.3	5243.9	5355.5	5467.1	5578.7	5690.3	5299.7	6,199.4
Latvia	5.1	5.3	5.4	5.5	5.7	5.8	6.0	6.1	5.6	32.2	33.1	33.9	34.8	35.6	36.5	37.4	38.2	35.2	40.8
Lithuania	5.4	8.7	12.1	15.5	18.8	22.2	25.6	28.9	17.2	30.6	49.8	69.0	88.2	107.4	126.5	145.7	164.9	97.8	114.9
Luxembourg	1.3	1.3	1.2	1.2	1.1	1.1	1.1	1.0	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.0	1.0	1.1	2.3
Malta	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.03	0.45	0.48	0.52	0.55	0.59	0.62	0.65	0.69	0.57	0.6
Netherlands	246.6	255.2	263.7	272.3	280.9	289.5	298.1	306.7	276.6	46.9	48.5	50.1	51.7	53.4	55.0	56.6	58.3	52.6	329.2
Poland	640.0	642.4	644.9	647.3	649.8	652.2	654.7	657.1	648.5	4620.4	4638.1	4655.8	4673.5	4691.2	4708.9	4726.6	4744.3	4682.4	5,330.9
Portugal	64.2	59.9	55.6	51.3	47.0	42.7	38.4	34.0	49.1	390.3	364.1	337.9	311.7	285.5	259.4	233.2	207.0	298.6	347.8
Romania	272.8	263.7	254.5	245.3	236.2	227.0	217.8	208.6	240.7	3732.3	3606.9	3481.4	3356.0	3230.5	3105.1	2979.6	2854.2	3293.3	3,534.0
Slovakia	29.3	27.8	26.4	24.9	23.4	22.0	20.5	19.0	24.2	239.3	227.3	215.3	203.3	191.3	179.3	167.3	155.3	197.3	221.5

Country	Blue WF of industrial production [Mm3/y]									Grey WF of industrial production [Mm3/y]									Total WF [Blue+Grey]
	2006	2007	2008	2009	2010	2011	2012	2013	Average	2006	2007	2008	2009	2010	2011	2012	2013	Average	
Slovenia	37.1	37.4	37.7	38.0	38.3	38.6	38.9	39.2	38.2	345.7	348.4	351.1	353.9	356.6	359.3	362.1	364.8	355.2	393.4
Spain	325.6	321.3	316.9	312.5	308.1	303.8	299.4	295.0	310.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	310.3
Sweden	80.9	81.4	81.8	82.2	82.7	83.1	83.5	84.0	82.4	215.3	216.4	217.6	218.7	219.9	221.0	222.2	223.3	219.3	301.7
UK	316.7	273.8	231.0	188.2	145.3	102.5	59.7	16.8	166.7	150.4	130.1	109.7	89.4	69.0	48.7	28.3	8.0	79.2	245.9
Total EU28	6,983	6,912	6,842	6,772	6,701	6,631	6,561	6,491	6,737	29,647	29,558	29,470	29,381	29,292	29,204	29,115	29,026	29,337	36,073

9.5 Appendix E: Total production water footprint of the EU28 (km³/y)

Country	Water footprint of production (average 2006-2013) - km ³ /year			
	Green WF	Blue WF	Grey WF	Total
Malta	0.000	0.013	0.037	0.050
Luxembourg	0.140	0.007	0.027	0.174
Cyprus	0.288	0.203	0.086	0.578
Estonia	1.382	0.025	0.249	1.655
Slovenia	1.855	0.090	1.149	3.093
Latvia	2.446	0.034	0.423	2.903
Finland	3.362	0.180	0.671	4.213
Netherlands	3.259	0.489	0.764	4.512
Croatia	3.742	0.054	0.787	4.583
Slovakia	4.386	0.213	1.027	5.625
Sweden	4.039	0.244	1.205	5.488
Lithuania	5.232	0.069	0.301	5.601
Austria	4.975	0.285	0.987	6.246
Ireland	5.829	0.155	0.428	6.411
Belgium	2.841	0.414	3.021	6.276
Denmark	6.198	0.165	1.216	7.579
Portugal	6.531	1.454	1.321	9.306
Czech Republic	7.606	0.264	2.857	10.727
Greece	9.903	3.504	1.500	14.907
Bulgaria	11.562	0.457	4.466	16.485
Hungary	14.291	0.454	4.838	19.583
United	20.712	0.644	4.141	25.497
Romania	29.726	1.271	6.050	37.048
Italy	33.356	5.877	13.998	53.231
Poland	40.368	1.138	12.160	53.666
Germany	40.115	2.526	13.434	56.075
Spain	49.298	13.557	8.081	70.936
France	65.042	4.759	14.627	84.428
Grand Total	378.481	38.546	99.850	516.877

9.6 Appendix F: List of internationally traded livestock products covered in the study

HS code	Product description as per ITC
010110	Pure-bred breeding horses, asses, mules, hinnies
010190	Live horses, etc. excl. pure bred for breeding)
010210	Bovine, live pure-bred breeding
010290	Bovine, live except pure-bred breeding
010310	Swine, live pure-bred breeding
010391	Swine, live except pure-bred breeding weighing less than 50 kg
010392	Swine, live except pure-bred breeding weighing 50 kg or more
010410	Sheep, live
010420	Goats, live
010511	Fowls, live domestic weighing not more than 185 g
010512	Live turkey chicks <=0.185kg
010519	Poultry, live except domestic fowls, weighing not more than 185 g
010592	Live fowl (gallus domesticus) weighing 0.185-2kg
010593	Live fowl (gallus domesticus) >2kg
010599	Poultry, live except domestic fowls, weighing more than 185 g
020110	Bovine carcasses and half carcasses, fresh or chilled
020120	Bovine cuts bone in, fresh or chilled
020130	Bovine cuts boneless, fresh or chilled
020210	Bovine carcasses and half carcasses, frozen
020220	Bovine cuts bone in, frozen
020230	Bovine cuts boneless, frozen
020311	Swine carcasses and half carcasses, fresh or chilled
020312	Hams, shoulders and cuts thereof, of swine bone in, fresh or chilled
020319	Swine cuts, fresh or chilled, nes
020321	Swine carcasses and half carcasses, frozen
020322	Hams, shoulders and cuts thereof, of swine, bone in, frozen
020329	Swine cuts, frozen nes
020410	Lamb carcasses and half carcasses, fresh or chilled
020421	Sheep carcasses and half carcasses, fresh or chilled
020422	Sheep cuts, bone in, fresh or chilled
020423	Sheep cuts, boneless, fresh or chilled
020430	Lamb carcasses and half carcasses, frozen
020441	Sheep carcasses and half carcasses, frozen
020442	Sheep cuts, bone in, frozen
020443	Sheep cuts, boneless, frozen
020450	Goat meat, fresh, chilled or frozen
020500	Horse, ass, mule or hinny meat, fresh, chilled or frozen
020610	Bovine edible offal, fresh or chilled
020621	Bovine tongues, edible offal, frozen
020622	Bovine livers, edible offal, frozen
020629	Bovine edible offal, frozen nes
020630	Swine edible offal, fresh or chilled
020641	Swine livers, edible offal, frozen
020649	Swine edible offal, frozen nes
020680	Sheep, goats, asses, mules or hinnies edible offal, fresh or chilled
020690	Sheep, goats, asses, mules or hinnies edible offal, frozen
020711	Fowls (gallus domesticus), whole, fresh or chilled

HS code	Product description as per ITC
020712	Fowls (gallus domesticus), whole, frozen
020713	Fowls (gallus domesticus), cuts & offal, fresh/chilled
020714	Fowls (gallus domesticus), cuts & offal, frozen
020724	Turkey, whole. fresh or chilled
020725	Turkey, whole, frozen
020726	Turkey, cuts & offal, fresh or chilled
020727	Turkey, cuts & offal, frozen
020732	Ducks/geese/guinea fowl, whole, fresh or chilled
020733	Ducks/geese/guinea fowl, whole, frozen
020734	Ducks/geese/guinea fowl, fatty livers, fresh/chilled
020735	Ducks/geese/guinea fowl, cuts/offal nes, fresh/chilled
020736	Ducks/geese/guinea fowl, cuts/offal, frozen
020810	Rabbit or hare meat and edible meat offal, fresh, chilled or frozen
020900	Pig fat lean meat free&poultry fat unrenderd,frsh,chilld,frozn or curd
021011	Hams, shoulders and cuts thereof, of swine bone in, cured
021012	Bellies, streaky and cuts thereof, swine cured
021019	Swine meat cured, nes
021020	Bovine meat cured
040110	Milk not concentrated and unsweetened not exceeding 1% fat
040120	Milk not concentrated & unsweetened exceeding 1% not exceeding 6% fat
040130	Milk and cream not concentrated and unsweetened exceeding 6% fat
040210	Milk powder not exceeding 1.5% fat
040221	Milk and cream powder unsweetened exceeding 1.5% fat
040229	Milk and cream powder sweetened exceeding 1.5% fat
040291	Milk and cream unsweetened, nes
040299	Milk and cream nes sweetened
040310	Yogurt concentratd o not,sweetend o not,flavourd o contg fruit o cocoa
040390	Buttermilk,curdled milk & cream,kephir & ferm or acid milk & cream nes
040410	Whey whether or not concentrated or sweetened
040490	Products consisting of natural milk constituents sweetened or not nes
040510	Butter
040520	Dairy spreads
040590	Fats and oils derived from milk nes
040610	Cheese, fresh (including whey cheese) unfermented, and curd
040620	Cheese, grated or powdered, of all kinds
040630	Cheese processed, not grated or powdered
040640	Cheese, blue-veined
040690	Cheese nes
040700	Eggs, bird, in shell, fresh, preserved or cooked
040811	Egg yolks dried
040819	Egg yolks nes
040891	Eggs, bird, not in shell, dried
040899	Eggs, bird, not in shell nes
160210	Homogenized preparations of meat and meat offal
160220	Livers of any animal prepared or preserved
160231	Turkey meat and meat offal prepared or preserved, excluding livers
160232	Fowl (gallus domesticus) meat, prepared/preserved
160239	Dom fowl,duck,goose&guinea fowl meat&meat offal prep/presvd exc livers
160241	Hams and cuts thereof of swine prepared or preserved
160242	Shoulders and cut thereof of swine prepared or preserved

HS code	Product description as per ITC
160249	Swine meat&meat offal nes/exc livers/ incl mixtures,prepared o preservd
160250	Bovine meat and meat offal nes,excluding livers, prepared or preserved
160290	Meat, meat offal or blood, prepared or preserved, nes
410120	Whole bovine hides < 16 kg
410150	Whole bovine hides > 16 kg
410190	Pieces of bovine hides
410210	Sheep or lamb skins, raw, with wool on, nes
410221	Sheep or lamb skins, pickled, without wool on
410229	Sheep or lamb skins, raw, o/t pickled, without wool on
410310	Goat or kid hides and skins, raw, nes
410330	Raw hides/skins of swine
410411	Tanned bovine hides, wet, grain splits
410419	Tanned whole bovine hides, wet <= 2.6 sq.m
410441	Tanned bovine hides, dry, grain splits
410449	Tanned whole bovine hides, dry <= 2.6 sq.m
410510	Tanned sheep/lamb skins, wet
410621	Tanned goat.kid skins, wet
410622	Tanned goat.kid skins, dry
410631	Tanned swine skins, wet
410632	Tanned goat.kid skins, dry
410711	Bovine full grains tanned leather hides
410712	Bovine grain splits tanned leather hides
410719	Bovine tanned leather hides, nes
410791	Bovine fullgrain tanned leather pieces
410792	Bovine grain splits tanned leather pieces
410799	Bovine tanned leather pieces, nes
411200	Sheep/lamb leather
411310	Goat leather
411320	Swine leather

9.7 Appendix G: List of internationally traded crop products covered in the study

Product code (HS)	(FAO)	Crop category	Product description (HS)
100110 / 100190	15	Cereals	Wheat (Durum wheat, Wheat nes and meslin)
110100	15	Cereals	Wheat or meslin flour
110100a	15	Cereals	Wheat bread
110100b	15	Cereals	Dry pasta
110311	15	Cereals	Wheat groats and meal
110321	15	Cereals	Wheat pellets
110811	15	Cereals	Wheat, starch
110900	15	Cereals	Wheat gluten, whether or not dried
100110 / 100190	15	Cereals	Durum wheat
110100	15	Cereals	Wheat nes and meslin
110321	15	Cereals	Cereal pellets
110100	15	Cereals	Flour,meal&powder of edible fruits&nuts&peel of citrus fruit or melons
100110 / 100190	15	Cereals	Bulgar wheat, worked (cooked) grains
110321	15	Cereals	Cereal pellets
100110 / 100190	15	Cereals	Durum wheat
110100	15	Cereals	Flour,meal&powder of edible fruits&nuts&peel of citrus fruit or melons
110100b	15	Cereals	Pasta nes
110100b	15	Cereals	Stuffed pasta, whether or not cooked or otherwise prepared
110100b	15	Cereals	Uncooked pasta not stuffed or otherwise prepared, containing eggs
110100b	15	Cereals	Uncooked pasta, not stuffed or otherwise prepared, nes
110900	15	Cereals	Wheat gluten, whether or not dried
110311	15	Cereals	Wheat groats and meal
110100	15	Cereals	Wheat nes and meslin
110100	15	Cereals	Wheat or meslin flour
110811	15	Cereals	Wheat, starch
100610	27	Cereals	Rice in the husk (paddy or rough)
100620	27	Cereals	Rice, husked (brown)
100630	27	Cereals	Rice, semi-milled or wholly milled, whether or not polished or glazed
100640	27	Cereals	Rice, broken
110230	27	Cereals	Rice flour
110314	27	Cereals	Rice groats and meal
110230	27	Cereals	Rice flour
100610	27	Cereals	Rice in the husk (paddy or rough)
100640	27	Cereals	Rice, broken
100620	27	Cereals	Rice, husked (brown)
100630	27	Cereals	Rice, semi-milled or wholly milled, whether or not polished or glazed
100300	44	Cereals	Barley
110411	44	Cereals	Barley, rolled or flaked grains
110421	44	Cereals	Barley,hulled,pearled,sliced or kibbled
110710	44	Cereals	Malt, not roasted
110720	44	Cereals	Malt, roasted
220300	44	Cereals	Beer made from malt
100300	44	Cereals	Barley
220300	44	Cereals	Beer made from malt
110710	44	Cereals	Malt, not roasted
110720	44	Cereals	Malt, roasted
1005	56	Cereals	Maize (corn)
100590	56	Cereals	Maize (corn) nes
110220	56	Cereals	Maize (corn) flour
110313	56	Cereals	Maize (corn) groats and meal
110423	56	Cereals	Maize (corn), hulled, pearled, sliced or kibbled
110812	56	Cereals	Maize (corn) starch
151521	56	Cereals	Maize (corn) oil crude
151529	56	Cereals	Maize (corn) oil and its fractions,refined but not chemically modified
100590	56	Cereals	Maize (corn) seed
110220	56	Cereals	Maize (corn) flour
110313	56	Cereals	Maize (corn) groats and meal
100590	56	Cereals	Maize (corn) nes
151529	56	Cereals	Maize (corn) oil and its fractions,refined but not chemically modified
151521	56	Cereals	Maize (corn) oil crude
100590	56	Cereals	Maize (corn) seed

Product code (HS)	(FAO)	Crop category	Product description (HS)
110812	56	Cereals	Maize (corn) starch
110423	56	Cereals	Maize (corn), hulled, pearled, sliced or kibbled
100590	56	Cereals	Sweet corn prepar'd or preserv'd, o/t by vinegar or acetic acid not frozen
100200	71	Cereals	Rye
110210	71	Cereals	Rye flour
100200	71	Cereals	Rye
110210	71	Cereals	Rye flour
100400	75	Cereals	Oats
110312	75	Cereals	Oat groats and meal
110412	75	Cereals	Oats, rolled or flaked grains
110422	75	Cereals	Oats, hulled, pearled, sliced or kibbled
100400	75	Cereals	Oats
110422	75	Cereals	Oats, hulled, pearled, sliced or kibbled
110412	75	Cereals	Oats, rolled or flaked grains
100820	79	Cereals	Millet
100820	79	Cereals	Millet
100700	83	Cereals	Grain sorghum
100700	83	Cereals	Grain sorghum
100810	89	Cereals	Buckwheat
100810	89	Cereals	Buckwheat
100890ac	92	Cereals	Quinoa
100890ad	94	Cereals	Fonio
100890ae	97	Cereals	Triticale
100830	101	Cereals	Canary seed
100830	101	Cereals	Canary seed
100890af	103	Cereals	Mixed grain
100890	108	Cereals	Cereals unmilled nes
110290	108	Cereals	Cereal flour nes
110319	108	Cereals	Cereal groats and meal nes
110329	108	Cereals	Cereal pellets nes
110419	108	Cereals	Cereals, rolled or flaked grains nes
110429	108	Cereals	Cereals, hulled, pearled, sliced or kibbled nes
110430	108	Cereals	Germ of cereals, whole, rolled, flaked or ground
110290	108	Cereals	Cereal flour nes
110319	108	Cereals	Cereal groats and meal nes
100890	108	Cereals	Cereals unmilled nes
110429	108	Cereals	Cereals, hulled, pearled, sliced or kibbled nes
110419	108	Cereals	Cereals, rolled or flaked grains nes
100890	108	Cereals	Cereals, exc maize (corn), in grain form, pre-cook'd or otherwise prepar'd
110430	108	Cereals	Germ of cereals, whole, rolled, flaked or ground
070190	116	Roots&Tuber	Potatoes, fresh or chilled nes
070190a	116	Roots&Tuber	Tapioca of potatoes
071010	116	Roots&Tuber	Potatoes, frozen
110510	116	Roots&Tuber	Potato flour and meal
110520	116	Roots&Tuber	Potato flakes
110813	116	Roots&Tuber	Potato starch
070190	116	Roots&Tuber	Potatoes seed, fresh or chilled
110520	116	Roots&Tuber	Potato flakes
110510	116	Roots&Tuber	Potato flour and meal
110813	116	Roots&Tuber	Potato starch
070110	116	Roots&Tuber	Potatoes prepar'd or preserv'd oth than by vinegar or acetic acid, frozen
070110	116	Roots&Tuber	Potatoes prepar'd or preserv'd, o/t by vinegar or acetic acid, not frozen
070190	116	Roots&Tuber	Potatoes seed, fresh or chilled
070190	116	Roots&Tuber	Potatoes, fresh or chilled nes
071010	116	Roots&Tuber	Potatoes, frozen
071420	122	Roots&Tuber	Sweet potatoes, fresh or dried, whether or not sliced or pelleted
071420	122	Roots&Tuber	Sweet potatoes, fresh or dried, whether or not sliced or pelleted
071410	125	Roots&Tuber	Manioc (cassava), fresh or dried, whether or not sliced or pelleted
071410a	125	Roots&Tuber	Tapioca of cassava
071410b	125	Roots&Tuber	Flour of cassava
071410c	125	Roots&Tuber	Dried cassava
110814	125	Roots&Tuber	Manioc (cassava) starch
110814	125	Roots&Tuber	Starches nes
110814	125	Roots&Tuber	Manioc (cassava) starch
071410	125	Roots&Tuber	Manioc (cassava), fresh or dried, whether or not sliced or pelleted

Product code (HS)	(FAO)	Crop category	Product description (HS)
110814	125	Roots&Tuber	Starches nes
071490ba	135	Roots&Tuber	Yautia (cocoyam)
071490_bb	136	Roots&Tuber	Taro (coco yam)
071490_a	137	Roots&Tuber	Yams
070690	137	Roots&Tuber	Salad beetroot,salsif,celeriac,radish&sim edibl roots,fresh/chilld nes
071490	137	Roots&Tuber	Arrowroot,salep etc fr o drid whether o not slicd o pelletd&sago pith
071490	137	Roots&Tuber	Arrowroot,salep etc fr o drid whether o not slicd o pelletd&sago pith
070690	137	Roots&Tuber	Salad beetroot,salsif,celeriac,radish&sim edibl roots,fresh/chilld nes
071490_bc	149	Roots&Tuber	Roots and tubers nes
121292	156	SugarCrops	Sugar cane, fresh or dried, whether or not ground
170111	156	SugarCrops	Raw sugar, cane
170191	156	SugarCrops	Refined sugar,in solid form,containg added flavourg or colourg matter
170199	156	SugarCrops	Refined sugar, in solid form, nes
170220	156	SugarCrops	Maple sugar and maple syrup
170230	156	SugarCrops	Glucose&glucose syrup nt cntg fruct/cntg in dry state <20% by wt fruct
170240	156	SugarCrops	Glucose inc syrup cntg in dry state min 20% but <50% by wt of fructose
170250	156	SugarCrops	Fructose, chemically pure
170260	156	SugarCrops	Fructose&fructose syrup nes,cntg in dry state >50% by wght of fructose
170310	156	SugarCrops	Cane molasses
170310	156	SugarCrops	Cane molasses
170260	156	SugarCrops	Fructose&fructose syrup nes,cntg in dry state >50% by wght of fructose
170250	156	SugarCrops	Fructose, chemically pure
170240	156	SugarCrops	Glucose inc syrup cntg in dry state min 20% but <50% by wt of fructose
170230	156	SugarCrops	Glucose&glucose syrup nt cntg fruct/cntg in dry state <20% by wt fruct
170220	156	SugarCrops	Maple sugar and maple syrup
170111	156	SugarCrops	Raw sugar, cane
170199	156	SugarCrops	Refined sugar, in solid form, nes
170191	156	SugarCrops	Refined sugar,in solid form,containg added flavourg or colourg matter
121291	157	SugarCrops	Sugar beet, fresh or dried, whether or not ground
170112	157	SugarCrops	Raw sugar, beet
170390	157	SugarCrops	Molasses nes
170390	157	SugarCrops	Molasses nes
170112	157	SugarCrops	Raw sugar, beet
121291	157	SugarCrops	Sugar beet, fresh or dried, whether or not ground
121299ab	161	SugarCrops	Sugar crops, nes
170290	161	SugarCrops	Sugar nes, including invert sugar
170290	161	SugarCrops	Sugar nes, including invert sugar
071332	176	Pulses	Beans,small red (Adzuki) dried,shelled,whether or not skinned or split
071333	176	Pulses	Kidney beans&white pea beans drid shelld,whether o not skinnd o split
071339	176	Pulses	Beans dried, shelled, whether or not skinned or split, nes
110610	176	Pulses	Flour and meal of the dried leguminous vegetables of heading No 07.13
071339	176	Pulses	Beans nes prepard or preservd,o/t by vinegar or acetic acid,not frozen
071339	176	Pulses	Beans,shelld prepard/preservd,o/t by vinegar/acetic acid,not frozen
071339	176	Pulses	Beans dried, shelled, whether or not skinned or split, nes
071332	176	Pulses	Beans,small red (Adzuki) dried,shelled,whether or not skinned or split
110610	176	Pulses	Flour and meal of the dried leguminous vegetables of heading No 07.13
071333	176	Pulses	Kidney beans&white pea beans drid shelld,whether o not skinnd o split
071350	181	Pulses	Broad beans&horse beans dried,shelled,whether or not skinned or split
071350	181	Pulses	Broad beans&horse beans dried,shelled,whether or not skinned or split
071310	187	Pulses	Peas dried, shelled, whether or not skinned or split
071310	187	Pulses	Leguminous vegetables dried,shelled,whether or not skinnd or split,nes
071310	187	Pulses	Leguminous vegetables dried,shelled,whether or not skinnd or split,nes
071310	187	Pulses	Peas dried, shelled, whether or not skinned or split
071310	187	Pulses	Peas prepard o preservd,oth than by vinegar o acetic acid,not frozen
071320	191	Pulses	Chickpeas, dried, shelled, whether or not skinned or split
071320	191	Pulses	Chickpeas, dried, shelled, whether or not skinned or split
07133_b	195	Pulses	Cow peas, dry
071390aa	197	Pulses	Pigeon peas
071340	201	Pulses	Lentils dried, shelled, whether or not skinned or split
071340	201	Pulses	Lentils dried, shelled, whether or not skinned or split
071390ad	203	Pulses	Bambara beans
071390ac	205	Pulses	Vetches
071390ab	210	Pulses	Lupins
071331	210	Pulses	Urd,mung,black/green gram beans drid shelld,whether/not skinnd/split

Product code (HS)	(FAO)	Crop category	Product description (HS)
071331	210	Pulses	Urd,mung,black/green gram beans drid shelld,whether/not skinnd/split
071390ae	211	Pulses	Pulses nes
080121	216	Pulses	Brazil nuts, with shell
080121	216	Pulses	Brazil nuts, in shell, fresh or dried
080131_a	217	Pulses	Cashew nuts
080240	220	Nuts	Chestnuts, fresh or dried, whether or not shelled or peeled
080240	220	Nuts	Chestnuts, fresh or dried, whether or not shelled or peeled
080211	221	Nuts	Almonds in shell fresh or dried
080212	221	Nuts	Almonds,fresh or dried,shelled or peeled
080211	221	Nuts	Almonds in shell fresh or dried
080212	221	Nuts	Almonds,fresh or dried,shelled or peeled
080231	222	Nuts	Walnuts in shell, fresh or dried
080232	222	Nuts	Walnuts, fresh or dried, shelled or peeled
080231	222	Nuts	Walnuts in shell, fresh or dried
080232	222	Nuts	Walnuts, fresh or dried, shelled or peeled
080250	223	Nuts	Pistachios, fresh or dried, whether or not shelled or peeled
080250	223	Nuts	Pistachios, fresh or dried, whether or not shelled or peeled
080290aa	224	Nuts	Kolanuts
080221	225	Nuts	Hazelnuts or filberts in shell fresh or dried
080222	225	Nuts	Hazelnuts or filberts, fresh or dried, shelled or peeled
080221	225	Nuts	Hazelnuts or filberts in shell fresh or dried
080222	225	Nuts	Hazelnuts or filberts, fresh or dried, shelled or peeled
080290ab	226	Nuts	Arecanuts
080290	234	Nuts	Nuts edible, fresh or dried, whether or not shelled or peeled, nes
080290	234	Nuts	Brazil nuts, without shell, fresh or dried
080290	234	Nuts	Cashew nuts, in shell, fresh or dried
080290	234	Nuts	Cashew nuts, without shell, fresh or dried
080290	234	Nuts	Brazil nuts, without shell, fresh or dried
080290	234	Nuts	Cashew nuts, in shell, fresh or dried
080290	234	Nuts	Cashew nuts, without shell, fresh or dried
080290	234	Nuts	Nuts edible, fresh or dried, whether or not shelled or peeled, nes
120100	236	Soybeans	Soya beans
120100a	236	Soybeans	Soya sauce
120100b	236	Soybeans	Soya paste
120100c	236	Soybeans	Soya curd
120100d	236	Soybeans	Soy milk
120100e	236	Soybeans	Soy burger
120810	236	Soybeans	Soya bean flour and meals
150710	236	Soybeans	Soya-bean oil crude, whether or not degummed
150790	236	Soybeans	Soya-bean oil and its fractions, refined but not chemically modified
230400	236	Soybeans	Soya-bean oil-cake&oth solid residues,whether or not ground or pellet
120810	236	Soybeans	Soya bean flour and meals
120100	236	Soybeans	Soya beans
150790	236	Soybeans	Soya-bean oil and its fractions, refined but not chemically modified
150710	236	Soybeans	Soya-bean oil crude, whether or not degummed
230400	236	Soybeans	Soya-bean oil-cake&oth solid residues,whether or not ground or pellet
120210	242	Nuts	Ground-nuts in shell not roasted or otherwise cooked
120220	242	Nuts	Ground-nuts shelld,whether or not broken,not roastd or otherwise cookd
150810	242	Nuts	Ground-nut oil, crude
150890	242	Nuts	Ground-nut oil and its fractions refined but not chemically modified
230500	242	Nuts	Ground-nut oil-cake&oth solid residues,whether or not ground or pellet
150890	242	Nuts	Ground-nut oil and its fractions refined but not chemically modified
150810	242	Nuts	Ground-nut oil, crude
230500	242	Nuts	Ground-nut oil-cake&oth solid residues,whether or not ground or pellet
120210	242	Nuts	Ground-nuts in shell not roasted or otherwise cooked
120220	242	Nuts	Ground-nuts shelld,whether or not broken,not roastd or otherwise cookd
080119	249	Oilcrops	Coconuts
120300	249	Oilcrops	Copra
120300a	249	Oilcrops	Coconut (husked)
151311	249	Oilcrops	Coconut (copra) oil crude
151319	249	Oilcrops	Coconut (copra) oil&its fractions refined but not chemically modified
230650	249	Oilcrops	Coconut/copra oil-cake&oth solid residues,whether/not ground/pellet
530511	249	Oilcrops	Coconut (coir) fibre, raw
530519	249	Oilcrops	Coconut (coir) fibre,processd nt spun;tow,noils&waste of coconut fib
120710	249	Oilcrops	Palm nuts and kernels, whether or not broken

Product code (HS)	(FAO)	Crop category	Product description (HS)
120300a	249	Oilcrops	Coconuts, dessicated
530511	249	Oilcrops	Coconut (coir) fibre, raw
530519	249	Oilcrops	Coconut (coir) fibre,processd nt spun;tow,noils&waste of coconut fib
151311	249	Oilcrops	Coconut (copra) oil crude
151319	249	Oilcrops	Coconut (copra) oil&its fractions refined but not chemically modified
230650	249	Oilcrops	Coconut/copra oil-cake&oth solid residues,whether/not ground/pellet
120300a	249	Oilcrops	Coconuts, dessicated
080119	249	Oilcrops	Coconuts, excluding dessicated
120300	249	Oilcrops	Copra
530519	249	Oilcrops	Floor coverings of coconut fibres (coir)
120710	249	Oilcrops	Palm nuts and kernels, whether or not broken
120710ab	254	Oilcrops	Oil palm fruit
151110	254	Oilcrops	Palm oil, crude
151190	254	Oilcrops	Palm oil and its fractions refined but not chemically modified
151321	254	Oilcrops	Palm kernel or babassu oil, crude
151329	254	Oilcrops	Palm kernel/babassu oil their fract,refind but not chemically modifid
230660	254	Oilcrops	Palm nut/kernel oil-cake&oth solid residues,whether/not ground/pellet
151321	254	Oilcrops	Palm kernel or babassu oil, crude
151329	254	Oilcrops	Palm kernel/babassu oil their fract,refind but not chemically modifid
230660	254	Oilcrops	Palm nut/kernel oil-cake&oth solid residues,whether/not ground/pellet
151190	254	Oilcrops	Palm oil and its fractions refined but not chemically modified
151110	254	Oilcrops	Palm oil, crude
070990aa	260	Oilcrops	Olives
071120	260	Oilcrops	Olives,provisionally preservd but nt suitable f immediate consumption
150910	260	Oilcrops	Olive oil, virgin
150990	260	Oilcrops	Olive oil and its fractions refined but not chemically modified
151000	260	Oilcrops	Oils&thr fract nes obt from olives,ref'd/not,not chem mod,incl blends
150990	260	Oilcrops	Olive oil and its fractions refined but not chemically modified
150910	260	Oilcrops	Olive oil, virgin
071120	260	Oilcrops	Olives prepared or preserved,other than by vinegar or acetic acid-,not frozen
071120	260	Oilcrops	Olives,provisionally preserved but not suitable for immediate consumption
120730	265	Oilcrops	Castor oil seeds, whether or not broken
151530	265	Oilcrops	Castor oil&its fractions, whether or not refined,but not chemically modified
120730	265	Oilcrops	Castor oil seeds, whether or not broken
151530	265	Oilcrops	Castor oil&its fractions,whether or not refined,but not chemically modified
120600	267	Oilcrops	Sunflower seeds, whether or not broken
151211	267	Oilcrops	Sunflower-seed or safflower oil, crude
151219	267	Oilcrops	Sunflower-seed/safflower oil&their fractions refined but not chemically modified
230630	267	Oilcrops	Sunflower seed oil-cake&other solid residues,vwhether or not ground/pellet
230630	267	Oilcrops	Sunflower seed oil-cake&other solid residues whether or not ground/pellet
120600	267	Oilcrops	Sunflower seeds, whether or not broken
151219	267	Oilcrops	Sunflower-seed/safflower oil & their fractions refined but not chemically modified
151211	267	Oilcrops	Sunflower-seed or safflower oil, crude
120500	270	Oilcrops	Rape or colza seeds, whether or not broken
151410	270	Oilcrops	Rape, colza or mustard oil crude
151490	270	Oilcrops	Rape,colza or mustard oil&their fractions,refined but not chemically modified
230640	270	Oilcrops	Rape/colza seed oil-cake&other solid residues whether or not ground/pellet
151410	270	Oilcrops	Rape/colza oil, crude, non-food, erucic acid <2%
151490	270	Oilcrops	Rape/colza oil, non-crude, non-food,erucic acid <2%
151410	270	Oilcrops	Rape/colza oil, crude, non-food, erucic acid >=2%
151490	270	Oilcrops	Rape/colza oil, non-crude, non-food,erucic acid >=2%
151490	270	Oilcrops	Veg fats&oils nes&their fractions,refined or not but not chemically modified
230640	270	Oilcrops	Oil-cake from high erucic acid rape/colza
230640	270	Oilcrops	Oil-cake from low erucic acid rape/colza
151410	270	Oilcrops	Rape/colza oil, crude, non-food, erucic acid <2%
151410	270	Oilcrops	Rape/colza oil, crude, non-food, erucic acid >=2%
151490	270	Oilcrops	Rape/colza oil, non-crude, non-food,erucic acid <2%
151490	270	Oilcrops	Rape/colza oil, non-crude, non-food,erucic acid >=2%
120500	270	Oilcrops	Rape/colza seeds, sowing, erucic acid <2%
120500	270	Oilcrops	Rape/colza seeds, sowing, erucic acid >=2%
151490	270	Oilcrops	Veg fats&oils nes&their fractions,refined or not but not chemically modified
120760	280	Oilcrops	Safflower seeds, whether or not broken
120760	280	Oilcrops	Safflower seeds, whether or not broken
120740	289	Oilcrops	Sesamum seeds, whether or not broken

Product code (HS)	(FAO)	Crop category	Product description (HS)
151550	289	Oilcrops	Sesame oil&its fractions whether or not refined,but not chemically modified
151550	289	Oilcrops	Sesame oil&its fractions whether or not refined,but not chemically modified
120740	289	Oilcrops	Sesamum seeds, whether or not broken
120750	292	Oilcrops	Mustard seeds, whether or not broken
120750	292	Oilcrops	Mustard seeds, whether or not broken
120791	296	Oilcrops	Poppy seeds, whether or not broken
120791	296	Oilcrops	Poppy seeds, whether or not broken
12079ab	299	Oilcrops	Melonseed
120720a	328	FibreCrops	Seed cotton
120720	328	FibreCrops	Cotton seeds, whether or not broken
120720b	328	FibreCrops	Cotton lint
140420	328	FibreCrops	Cotton linters
151221	328	FibreCrops	Cotton-seed oil crude, whether or not gossypol has been removed
151229	328	FibreCrops	Cotton-seed and its fractions refined but not chemically modified
230610	328	FibreCrops	Cotton sed oil-cake&other solid residues whether or not ground or pellet
520100	328	FibreCrops	Cotton, not carded or combed
520210	328	FibreCrops	Cotton yarn waste (including thread waste)
520291	328	FibreCrops	Garnetted stock of cotton
520299	328	FibreCrops	Cotton waste, nes
520300	328	FibreCrops	Cotton, carded or combed
	328	FibreCrops	Cotton fabric and finished textiles
520300	328	FibreCrops	"Kelem", "Schumacks", "Karamanie" and similar textile hand-woven rugs
520300	328	FibreCrops	"Long pile" knitted or crocheted textile fabrics
520300	328	FibreCrops	Bed linen, of cotton, nes
520300	328	FibreCrops	Bed linen, of cotton, printed, not knitted
520300	328	FibreCrops	Chenille fabrics of cotton, o/t narrow fabrics
140420	328	FibreCrops	Cotton linters
230610	328	FibreCrops	Cotton sed oil-cake&oth solid residues,whether or not ground or pellet
120720	328	FibreCrops	Cotton seeds, whether or not broken
520210	328	FibreCrops	Cotton yarn waste (including thread waste)
520300	328	FibreCrops	Cotton, carded or combed
520100	328	FibreCrops	Cotton, not carded or combed
151229	328	FibreCrops	Cotton-seed and its fractions refined but not chemically modified
151221	328	FibreCrops	Cotton-seed oil crude, whether or not gossypol has been removed
520300	328	FibreCrops	Curtains,drapes,interior blinds&curtain or bed valances,of cotton,knit
520300	328	FibreCrops	Curtains/drapes/interior blinds&curtain/bd valances,of cotton,not knit
520300	328	FibreCrops	Cut corduroy fabrics of cotton, o/t narrow fabrics
520300	328	FibreCrops	Denim fabrics of cotton, <85% mixed with m-m fib, more than 200 g/m2
520300	328	FibreCrops	Denim fabrics of cotton,>=85%, more than 200 g/m2
520300	328	FibreCrops	Dyed wide warp knit cotton
520300	328	FibreCrops	Embroidery of cotton, in the piece, in strips or in motifs, nes
520300	328	FibreCrops	Furnishing articles nes, of cotton, not knitted or crocheted
520291	328	FibreCrops	Garnetted stock of cotton
520300	328	FibreCrops	Gauze of cotton, o/t narrow fabrics
520300	328	FibreCrops	Looped pile knitted or crocheted fabrics, of cotton
520300	328	FibreCrops	Multi-colour thread wide warp knit cotton
520300	328	FibreCrops	Narrow crochet/knit cotton fabrics
520300	328	FibreCrops	Narrow woven fabrics of cotton, nes
520300	328	FibreCrops	Pile knitted or crocheted fabrics, of cotton, nes
520300	328	FibreCrops	Plain weave cotton fabric,<85% mixd w m-m fib,more than 200 g/m2,bleachd
520300	328	FibreCrops	Plain weave cotton fabric,<85% mixd w m-m fib,more than 200 g/m2,printd
520300	328	FibreCrops	Plain weave cotton fabric,<85% mixd w m-m fib,more than 200 g/m2,yarn dyd
520300	328	FibreCrops	Plain weave cotton fabric,<85% mixd w m-m fib,more thn 200 g/m2,unbleachd
520300	328	FibreCrops	Plain weave cotton fabric,<85% mixd w m-m fib,not more than 200 g/m2,bl
520300	328	FibreCrops	Plain weave cotton fabric,<85% mixd w m-m fib,not more than 200 g/m2,dyd
520300	328	FibreCrops	Plain weave cotton fabric,<85% mixd w m-m fib,not more than 200 g/m2,unbl
520300	328	FibreCrops	Plain weave cotton fabric,<85% mixd w m-m fib,nt mor thn 200g/m2,yarn dyd
520300	328	FibreCrops	Plain weave cotton fabrcl,<85% mixd w m-m fib,nt more thn 200 g/m2,printd
520300	328	FibreCrops	Plain weave cotton fabric,<85% mixed with m-m fib,more than 200 g/m2,dyed
520300	328	FibreCrops	Plain weave cotton fabric,>=85%, >100 g/m2 to 200 g/m2, bleached
520300	328	FibreCrops	Plain weave cotton fabric,>=85%, >100 g/m2 to 200 g/m2, printed
520300	328	FibreCrops	Plain weave cotton fabric,>=85%, >100 g/m2 to 200 g/m2, unbleached
520300	328	FibreCrops	Plain weave cotton fabric,>=85%, more than 200 g/m2, bleached
520300	328	FibreCrops	Plain weave cotton fabric,>=85%, more than 200 g/m2, unbleached
520300	328	FibreCrops	Plain weave cotton fabric,>=85%, not more than 100 g/m2, dyed

Product code (HS)	(FAO)	Crop category	Product description (HS)
520300	328	FibreCrops	Plain weave cotton fabric,>=85%, not more than 100 g/m2, unbleached
520300	328	FibreCrops	Plain weave cotton fabric,>=85%, not more than 100 g/m2, yarn dyed
520300	328	FibreCrops	Plain weave cotton fabric,>=85%,>100g/m= to 200g/m=, dyed
520300	328	FibreCrops	Plain weave cotton fabrics,>=85%, >100 g/m2 to 200 g/m2, yarn dyed
520300	328	FibreCrops	Plain weave cotton fabrics,>=85%, more than 200 g/m2, dyed
520300	328	FibreCrops	Plain weave cotton fabrics,>=85%, more than 200 g/m2, printed
520300	328	FibreCrops	Plain weave cotton fabrics,>=85%, more than 200 g/m2, yarn dyed
520300	328	FibreCrops	Plain weave cotton fabrics,>=85%, not more than 100 g/m2, bleached
520300	328	FibreCrops	Plain weave cotton fabrics,>=85%, not more than 100 g/m2, printed
520300	328	FibreCrops	Plain weave polyester staple fibre fab,<85%,mixd w/cotton,>170g/m2,unbl/bl
520300	328	FibreCrops	Plain weave polyester staple fibre fab,<85%,mixd w/cotton,<=170g/m2,dyd
520300	328	FibreCrops	Plain weave polyester staple fibre fab,<85%,mixd w/cotton,>170g/m2,dyd
520300	328	FibreCrops	Printed wide warp knit cotton
520300	328	FibreCrops	Table linen, of cotton, not knitted
520300	328	FibreCrops	Terry towellg & similar woven terry fabric of cotton,o/t narrow fabric,unbl
520300	328	FibreCrops	Terry towellg&similar woven terry fab of cotton,o/t unbl&o/t narow fabric
520300	328	FibreCrops	Toilet and kitchen linen, of cotton, nes
520300	328	FibreCrops	Toilet&kitchen linen,of terry towellg or similar terry fabric,of cotton
520300	328	FibreCrops	Twill weave cotton fabric,<85% mixd w m-m fib,more than 200 g/m2,bleachd
520300	328	FibreCrops	Twill weave cotton fabric,<85% mixd w m-m fib,more than 200 g/m2,printd
520300	328	FibreCrops	Twill weave cotton fabric,<85% mixd w m-m fib,not more than 200 g/m2,bl
520300	328	FibreCrops	Twill weave cotton fabric,<85% mixd w m-m fib,not more than 200 g/m2,dyd
520300	328	FibreCrops	Twill weave cotton fabric,<85% mixd w m-m fib,not more than 200 g/m2,unbl
520300	328	FibreCrops	Twill weave cotton fabric,<85% mixd w m-m fib,nt mor thn 200g/m2,yarn dyd
520300	328	FibreCrops	Twill weave cotton fabric,<85% mixd w m-m fib,nt more thn 200g/m2,printd
520300	328	FibreCrops	Twill weave cotton fabric,<85% mixed with m-m fib,more than 200 g/m2,dyed
520300	328	FibreCrops	Twill weave cotton fabric,<85% mixed with m-m fib,more than 200 g/m2,unbl
520300	328	FibreCrops	Twill weave cotton fabric,o/t denim,<85% mixd w m-m fib,>200g/m2,yarn dyd
520300	328	FibreCrops	Twill weave cotton fabric,o/t denim,>=85%,more than 200 g/m2,yarn dyed
520300	328	FibreCrops	Twill weave cotton fabric,>=85%, more than 200 g/m2, unbleached
520300	328	FibreCrops	Twill weave cotton fabric,>=85%, not more than 200 g/m2, bleached
520300	328	FibreCrops	Twill weave cotton fabric,>=85%, not more than 200 g/m2, printed
520300	328	FibreCrops	Twill weave cotton fabric,>=85%, not more than 200 g/m2, unbleached
520300	328	FibreCrops	Twill weave cotton fabric,>=85%, not more than 200 g/m2, yarn dyed
520300	328	FibreCrops	Twill weave cotton fabrics,>=85%, more than 200 g/m2, bleached
520300	328	FibreCrops	Twill weave cotton fabrics,>=85%, more than 200 g/m2, dyed
520300	328	FibreCrops	Twill weave cotton fabrics,>=85%, more than 200 g/m2, printed
520300	328	FibreCrops	Twill weave cotton fabrics,>=85%, not more than 200 g/m2, dyed
520300	328	FibreCrops	Twill weave polyest stapl fib fab,<85%,mixd w/cotton,>170g/m2,unbl/bl
520300	328	FibreCrops	Twill weave polyest staple fib fab,<85%,mixd w/cotton,<=170g/m2,dyd
520300	328	FibreCrops	Twill weave polyester staple fibre fab,<85%,mixd w/cotton,>170g/m2,dyd
520300	328	FibreCrops	Unbleached/bleached wide warp knit cotton
520300	328	FibreCrops	Wide cotton knit/crochet fabric, bleach/unbleach
520300	328	FibreCrops	Wide cotton knit/crochet fabric, dyed
520300	328	FibreCrops	Wide cotton knit/crochet fabric, multi-colour
520300	328	FibreCrops	Wide cotton knit/crochet fabric, printed
520300	328	FibreCrops	Woven fabrics of cotton,<85% mixed with m-m fib,<=200 g/m2,unbl,nes
520300	328	FibreCrops	Woven fabrics of artificial staple fib, <85% mixed with cotton, dyed
520300	328	FibreCrops	Woven fabrics of artificial staple fib,<85% mixd with cotton,unbl o bl
520300	328	FibreCrops	Woven fabrics of artificial staple fib,<85% mixd with cotton,yarn dyd
520300	328	FibreCrops	Woven fabrics of artificial staple fib,<85% mixed with cotton,printed
520300	328	FibreCrops	Woven fabrics of cotton, >200 g/m2, of yarns of different colours, nes
520300	328	FibreCrops	Woven fabrics of cotton, weighing more than 200 g/m2, bleached, nes
520300	328	FibreCrops	Woven fabrics of cotton, weighing more than 200 g/m2, dyed, nes
520300	328	FibreCrops	Woven fabrics of cotton, weighing more than 200 g/m2, printed, nes
520300	328	FibreCrops	Woven fabrics of cotton, weighing more than 200 g/m2, unbleached, nes
520300	328	FibreCrops	Woven fabrics of cotton, weighing not more than 200 g/m2, dyed, nes
520300	328	FibreCrops	Woven fabrics of cotton, weighing not more than 200 g/m2, printed, nes
520300	328	FibreCrops	Woven fabrics of cotton,<=200g/m2,of yarns of different colours,nes
520300	328	FibreCrops	Woven fabrics of cotton,<85% mixd w m-m fib,mor thn 200g/m2,printd,nes
520300	328	FibreCrops	Woven fabrics of cotton,<85% mixd w m-m fib,more than 200 g/m2,bl,nes
520300	328	FibreCrops	Woven fabrics of cotton,<85% mixd w m-m fib,more than 200 g/m2,dyd,nes
520300	328	FibreCrops	Woven fabrics of cotton,<85% mixd w m-m fib,more thn 200g/m2,unbl,nes
520300	328	FibreCrops	Woven fabrics of cotton,<85% mixd with m-m fib,<=200 g/m2, bl, nes

Product code (HS)	(FAO)	Crop category	Product description (HS)
520300	328	FibreCrops	Woven fabrics of cotton,<85% mixd with m-m fib,<=200 g/m2,dyed,nes
520300	328	FibreCrops	Woven fabrics of cotton,<85% mixd with m-m fib,>200 g/m2,yarn dyed,nes
520300	328	FibreCrops	Woven fabrics of cotton,<85% mixed w m-m fib,<=200g/m2,yarn dyed,nes
520300	328	FibreCrops	Woven fabrics of cotton,<85% mixed with m-m fib,<=200g/m2,printed,nes
520300	328	FibreCrops	Woven fabrics of cotton,>=85%, more than 200 g/m2, bleached, nes
520300	328	FibreCrops	Woven fabrics of cotton,>=85%, more than 200 g/m2, dyed, nes
520300	328	FibreCrops	Woven fabrics of cotton,>=85%, more than 200 g/m2, printed, nes
520300	328	FibreCrops	Woven fabrics of cotton,>=85%, more than 200 g/m2, yarn dyed, nes
520300	328	FibreCrops	Woven fabrics of cotton,>=85%, not more than 200 g/m2, dyed, nes
520300	328	FibreCrops	Woven fabrics of cotton,>=85%, not more than 200 g/m2,printed, nes
520300	328	FibreCrops	Woven fabrics of cotton,>=85%, not more than 200 g/m2,unbleached, nes
520300	328	FibreCrops	Woven fabrics of cotton,>=85%, nt more than 200 g/m2, bleached, nes
520300	328	FibreCrops	Woven fabrics of cotton,>=85%,more than 200 g/m2, unbleached, nes
520300	328	FibreCrops	Woven fabrics of cotton,>=85%,nt more than 200 g/m2, yarn dyed, nes
520300	328	FibreCrops	Woven fabrics of cotton,weighing not more than 200 g/m2,bleached,nes
520300	328	FibreCrops	Woven fabrics of cotton,weighing not more than 200 g/m2,unbleached,nes
520300	328	FibreCrops	Woven fabrics of oth syn staple fib,<85% mixd w/cotton,<=170g/m2,dyed
520300	328	FibreCrops	Woven fabrics of synthetic filaments,<85% mixd w cotton,unbl o bl,nes
520300	328	FibreCrops	Woven fabrics of synthetic filaments,<85% mixd w cotton,yarn dyd,nes
520300	328	FibreCrops	Woven fabrics of synthetic filaments,<85% mixd with cotton,printed,nes
520300	328	FibreCrops	Woven fabrics of synthetic filaments,<85% mixed with cotton,dyed,nes
520300	328	FibreCrops	Woven uncut weft pile fabrics of cotton, o/t terry and narrow fabrics
520300	328	FibreCrops	Woven warp pile fab of cotton,epingle (uncut),o/t terry&narrow fab
520300	328	FibreCrops	Woven warp pile fabrics of cotton, cut, o/t terry and narrow fabrics
520300	328	FibreCrops	Woven weft pile fabrics of cotton, nes
120400	333	Oilcrops	Linseed, whether or not broken
151511	333	Oilcrops	Linseed oil, crude
151519	333	Oilcrops	Linseed oil and its fractions, refined but not chemically modified
230620	333	Oilcrops	Linseed oil-cake&other solid residues,whether or not ground or pellet
151519	333	Oilcrops	Linseed oil and its fractions, refined but not chemically modified
151511	333	Oilcrops	Linseed oil, crude
230620	333	Oilcrops	Linseed oil-cake&other solid residues,whether or not ground or pellet
120400	333	Oilcrops	Linseed, whether or not broken
12079ag	336	Oilcrops	Hempseed
120792	336	Oilcrops	Shea nuts (karite nuts), whether or not broken
120799	336	Oilcrops	Oil seeds and oleaginous fruits, nes, whether or not broken
120799	336	Oilcrops	Oil seeds and oleaginous fruits, nes, whether or not broken
12079ak	339	Oilcrops	Oilseeds, Nes
120890	339	Oilcrops	Flours and meals of oil seeds or oleaginous fruits,except mustard,nes
151560	339	Oilcrops	Joboba oil&its fractions whether/not refind,but not chemically modifid
120890	339	Oilcrops	Flours and meals of oil seeds or oleaginous fruits,except mustard,nes
070490	358	Vegetables	Cabbages,kohlrabi,kale and sim edible brassicas nes,fresh or chilled
070490	358	Vegetables	Cabbages,kohlrabi,kale and sim edible brassicas nes,fresh or chilled
070910	366	Vegetables	Globe artichokes, fresh or chilled
070910	366	Vegetables	Globe artichokes, fresh or chilled
070920	367	Vegetables	Asparagus, fresh or chilled
070920	367	Vegetables	Asparagus prepard or preservd,o/t by vinegar or acetic acid,not frozen
070920	367	Vegetables	Asparagus, fresh or chilled
070511	372	Vegetables	Cabbage lettuce (head lettuce) fresh or chilled
070519	372	Vegetables	Lettuce, fresh or chilled nes
070511	372	Vegetables	Cabbage lettuce (head lettuce) fresh or chilled
070519	372	Vegetables	Lettuce, fresh or chilled nes
070970	373	Vegetables	Spinach,N-Z spinach & orache spinach (garden spinach),fresh or chilled
071030	373	Vegetables	Spinach, N-Z spinach and orache spinach (garden spinach), frozen
071030	373	Vegetables	Spinach, N-Z spinach and orache spinach (garden spinach), frozen
070970	373	Vegetables	Spinach,N-Z spinach & orache spinach (garden spinach),fresh or chilled
070200	388	Vegetables	Tomatoes, fresh or chilled
070200a	388	Vegetables	Tomato juice, concentrated
070200b	388	Vegetables	Tomato paste
070200c	388	Vegetables	Tomato ketchup
070200d	388	Vegetables	Tomato puree
070200e	388	Vegetables	Peeled tomatoes
070200f	388	Vegetables	Tomato, dried
200950	388	Vegetables	Tomato juice unfermented¬ spirited,whether or not sugared or sweet
200950	388	Vegetables	Tomato juice unfermented¬ spirited,whether or not sugared or sweet

Product code (HS)	(FAO)	Crop category	Product description (HS)
070200c	388	Vegetables	Tomato ketchup and other tomato sauces
070200	388	Vegetables	Tomatoes nes,prepared or preserved other than by vinegar or acetic acid
070200	388	Vegetables	Tomatoes, fresh or chilled
070200	388	Vegetables	Tomatoes,whole/in pieces prepard/preservd other than by vinegar/acetic acid
070410	393	Vegetables	Cauliflowers and headed broccoli, fresh or chilled
070420	393	Vegetables	Brussels sprouts, fresh or chilled
070420	393	Vegetables	Witloof chicory, fresh or chilled
070420	393	Vegetables	Chicory, fresh or chilled, nes
070420	393	Vegetables	Brussels sprouts, fresh or chilled
070410	393	Vegetables	Cauliflowers and headed broccoli, fresh or chilled
070420	393	Vegetables	Chicory, fresh or chilled, nes
070420	393	Vegetables	Witloof chicory, fresh or chilled
070990_b	394	Vegetables	Pumpkins, squash and gourds
070700	397	Vegetables	Cucumbers and gherkins, fresh or chilled
071140	397	Vegetables	Cucumbers&gherkins provisionally presvd,but not for immediate consumption
070700	397	Vegetables	Cucumbers and gherkins, fresh or chilled
070700	397	Vegetables	Cucumbers and gherkins,prepared or preserved by vinegar or acetic acid
071140	397	Vegetables	Cucumbers&gherkins provisionally preserved,but not for immediate consumption
070930	399	Vegetables	Aubergines(egg-plants), fresh or chilled
070930	399	Vegetables	Aubergines(egg-plants), fresh or chilled
070960	401	Vegetables	Peppers of the genus Capsicum or of the genus Pimenta,fresh or chilled
070960	401	Vegetables	Peppers of the genus Capsicum or of the genus Pimenta,fresh or chilled
070310	402	Vegetables	Onions and shallots, fresh or chilled
071110	402	Vegetables	Onions,provisionally presvrd but nt suitable f immediate consumption
070310	402	Vegetables	Onions and shallots, fresh or chilled
071220	403	Vegetables	Onions dried but not further prepared
071220	403	Vegetables	Onions dried but not further prepared
070320	406	Vegetables	Garlic, fresh or chilled
070320a	406	Vegetables	Garlic powder
070320	406	Vegetables	Leeks and other alliaceous vegetables, fresh or chilled
070320	406	Vegetables	Garlic, fresh or chilled
070320	406	Vegetables	Leeks and other alliaceous vegetables, fresh or chilled
070820	414	Vegetables	Beans, shelled or unshelled, fresh or chilled
071022	414	Vegetables	Beans, frozen
071022	414	Vegetables	Beans, frozen
070820	414	Vegetables	Beans, shelled or unshelled, fresh or chilled
070810	417	Vegetables	Peas, shelled or unshelled, fresh or chilled
071021	417	Vegetables	Peas, frozen
070810	417	Vegetables	Leguminous vegetables, shelled or unshelled, fresh or chilled nes
071021	417	Vegetables	Leguminous vegetables frozen nes
071021	417	Vegetables	Leguminous vegetables frozen nes
070810	417	Vegetables	Leguminous vegetables, shelled or unshelled, fresh or chilled nes
071021	417	Vegetables	Peas, frozen
070810	417	Vegetables	Peas, shelled or unshelled, fresh or chilled
070820_b	423	Vegetables	String beans
070610	426	Vegetables	Carrots and turnips, fresh or chilled
070940	426	Vegetables	Celery, other than celeriac, fresh or chilled
070610	426	Vegetables	Carrots and turnips, fresh or chilled
070940	426	Vegetables	Celery, other than celeriac, fresh or chilled
070990cb	430	Vegetables	Okra
070990ca	446	Vegetables	Maize, green
121210	461	Vegetables	Carobs
121210	461	Vegetables	Locust beans, including seeds, fresh or dried, whether or not ground
070990	463	Vegetables	Vegetables, fresh or chilled nes
071080	463	Vegetables	Vegetables, frozen nes
071090	463	Vegetables	Mixtures of vegetables, frozen
071190	463	Vegetables	Vegetables nes&mixtures provisionally preserved but not for immediate consumption
071290	463	Vegetables	Vegetables and mixtures dried, but not further prepared nes
121299	463	Vegetables	Vegetable products nes used primarily for human consumption
080300	463	Vegetables	Bananas including plantains, fresh or dried
080300	463	Vegetables	Bananas including plantains, fresh or dried
071090	463	Vegetables	Mixtures of vegetables, frozen
070990	463	Vegetables	Vegetable products nes
121299	463	Vegetables	Vegetable products nes used primarily for human consumption

Product code (HS)	(FAO)	Crop category	Product description (HS)
071290	463	Vegetables	Vegetables and mixtures dried, but not further prepared nes
071190	463	Vegetables	Vegetables nes&mixtures provisionally preserved but not for immediate consumption
070990	463	Vegetables	Vegetables, fresh or chilled nes
071080	463	Vegetables	Vegetables, frozen nes
080300aa	486	Fruits	Bananas
080300_b	489	Fruits	Plantains
080510	490	Fruits	Oranges, fresh or dried
200911	490	Fruits	Orange juice,unfermentd¬ spiritd,whether/not sugard/sweet,frozen
200919	490	Fruits	Orange juice nes,unfermentd¬ spiritd,whether or not sugard or sweet
200911	490	Fruits	Orange juice, unfermented, Brix value < 20
200919	490	Fruits	Orange juice nes,unfermentd¬ spiritd,whether or not sugard or sweet
200911	490	Fruits	Orange juice, unfermented, Brix value < 20
200911	490	Fruits	Orange juice,unfermentd¬ spiritd,whether/not sugard/sweet,frozen
080510	490	Fruits	Oranges, fresh or dried
080520	495	Fruits	Mandarins(tang&sats)clementines&wilkg&sim citrus hybrids,fresh/dried
080520	495	Fruits	Mandarins(tang&sats)clementines&wilkg&sim citrus hybrids,fresh/dreid
080530	497	Fruits	Lemons and limes, fresh or dried
080530	497	Fruits	Fresh or dried limes
080530	497	Fruits	Fresh or dried limes
080540	507	Fruits	Grapefruit, fresh or dried
200920	507	Fruits	Grapefruit juice,unfermentd¬ spirited,whether or not sugared or sweet
200920	507	Fruits	Grapefruit juice, unfermented, Brix value < 20
200920	507	Fruits	Grapefruit juice, unfermented, Brix value >= 20
200920	507	Fruits	Grapefruit juice, unfermented, Brix value < 20
200920	507	Fruits	Grapefruit juice, unfermented, Brix value >= 20
080540	507	Fruits	Grapefruit, fresh or dried
080590	512	Fruits	Citrus fruits, fresh or dried, nes
081400	512	Fruits	Peel of citrus fruit/melons (watermelons) fresh,frozen,dried/provisionally preserved
200930	512	Fruits	Citrus fruit juice nes exc mx unferment unspirited,whether/not sug/sweet
200980	512	Fruits	Fruit&veg juice nes (exc mx) unferment unspirited,whether/not sug/sweet
200990	512	Fruits	Mixtures of juices unfermentd¬ spiritd whether or not sugared or sweet
200930	512	Fruits	Citrus nes juice, unfermented, Brix value < 20
200930	512	Fruits	Citrus nes juice, unfermented, Brix value >= 20
080590	512	Fruits	Citrus fruit (marmalades,puree,etc) ckd prep whether/not sugared/sweetened
080590	512	Fruits	Citrus fruits nes,o/w prep or presvd,sugared,sweetened,spirited or not
080590	512	Fruits	Citrus fruits, fresh or dried, nes
200930	512	Fruits	Citrus nes juice, unfermented, Brix value < 20
200930	512	Fruits	Citrus nes juice, unfermented, Brix value >= 20
200980	512	Fruits	Fruit&veg juice nes (exc mx) unferment unspirited,whether/not sug/sweet
200990	512	Fruits	Mixtures of juices unfermentd¬ spiritd whether oe not sugared or sweet
081400	512	Fruits	Peel of citrus fruit/melons (watermelons) fresh,frz,dried/provisionally preserved
080810	515	Fruits	Apples, fresh
081330	515	Fruits	Apples, dried
200970	515	Fruits	Apple juice unfermented¬ spiritd whether or not sugared or sweetened
200970	515	Fruits	Apple juice, unfermented, Brix value < 20
200970	515	Fruits	Apple juice, unfermented, Brix value >= 20
200970	515	Fruits	Apple juice, unfermented, Brix value < 20
200970	515	Fruits	Apple juice, unfermented, Brix value >= 20
081330	515	Fruits	Apples, dried
080810	515	Fruits	Apples, fresh
080820	521	Fruits	Pears and quinces, fresh
080820	521	Fruits	Pears and quinces, fresh
080820	521	Fruits	Pears nes,o/w prep or presvd whether or not sugared,sweetened,spirited
080910	526	Fruits	Apricots, fresh
081310	526	Fruits	Apricots, dried
081310	526	Fruits	Apricots, dried
080910	526	Fruits	Apricots, fresh
080920_b	530	Fruits	Sour cherries
080920	531	Fruits	Cherries, fresh
081210	531	Fruits	Cherries provisionally preservd but unsuitable f immediate consumption
081210	531	Fruits	Cherries provisionally preservd but unsuitable f immediate consumption
080920	531	Fruits	Cherries, fresh
080930	534	Fruits	Peaches, including nectarines, fresh
080930	534	Fruits	Peaches nes,o/w prep o presvd whether o not sugard,sweetend o spiritd
080930	534	Fruits	Peaches, including nectarines, fresh

Product code (HS)	(FAO)	Crop category	Product description (HS)
080940	536	Fruits	Plums and sloes, fresh
081320	536	Fruits	Prunes, dried
080940	536	Fruits	Plums and sloes, fresh
081320	536	Fruits	Prunes, dried
081090ac	541	Fruits	Stone fruit, nes
081350	541	Fruits	Mixtures of edible nuts or dried fruits of this chapter
121230	541	Fruits	Apricot,peach/plum stones&kernels nes,usd primly f human consumption
121230	541	Fruits	Apricots nes,o/w prep o presvd whether or not sugared,sweetend or spirited
121230	541	Fruits	Apricot,peach/plum stones&kernels nes,usd primly f human consumption
081350	541	Fruits	Mixtures of edible nuts or dried fruits of this chapter
081010	544	Fruits	Strawberries, fresh
081110	544	Fruits	Strawberries,uncookd o steamd o boild in water,sweetend o not,frozen
081220	544	Fruits	Strawberries provis preservd but unsuitable f immediate consumption
081010	544	Fruits	Strawberries, fresh
081110	544	Fruits	Strawberries,uncooked or steamd ro boiled in water,sweetend or not,frozen
081020	547	Fruits	Raspberries, blackberries, mulberries and loganberries, fresh
081120	547	Fruits	Raspberries,mulberries,etc uncook,steam/boil in water sweetend/not,frozen
081020	547	Fruits	Raspberries, blackberries, mulberries and loganberries, fresh
081120	547	Fruits	Raspberries,mulberries,etc uncook,steam/boil in water sweetend/nt,frozen
081030_b	549	Fruits	Gooseberries
081030	549	Fruits	Black, white or red currants and gooseberries, fresh
081030	549	Fruits	Black, white or red currants and gooseberries, fresh
081030_a	550	Fruits	Currants
081040_c	552	Fruits	Blueberries
081040	554	Fruits	Cranberries, bilberries and other fruits of the genus Vaccinium, fresh
081040	554	Fruits	Cranberries, bilberries and other fruits of the genus Vaccinium, fresh
081040_b	558	Fruits	Berries Nes
080610	560	Fruits	Grapes, fresh
080620	560	Fruits	Grapes, dried
200960	560	Fruits	Grape juice (incl grape must) unferment&unspirtd,wthr/nt sug/sweet
220410	560	Fruits	Grape wines, sparkling
220421	560	Fruits	Grape wines nes,incl fort&grape must,unfermntd by add alc in ctrn<=2l
220429	560	Fruits	Grape wines nes,incl fort&grape must,unfermntd by add alc,in ctrn > 2l
220430	560	Fruits	Grape must nes, unfermented, other than that of heading No 20.09
220510	560	Fruits	Vermouth&oth grape wines flav w plants o arom subst in ctrn <= 2 l
220590	560	Fruits	Vermouth&oth grape wines flav with plants or arom subst in ctrn > 2 l
220600	560	Fruits	Fermented beverages nes (for example, cider, perry, mead, etc)
220820	560	Fruits	Spirits obtained by distilling grape wine or grape marc
200960	560	Fruits	Grape juice, unfermented, Brix value < 20
200960	560	Fruits	Grape juice, unfermented, Brix value >= 20
220600	560	Fruits	Fermented beverages nes (for example, cider, perry, mead, etc)
200960	560	Fruits	Grape juice, unfermented, Brix value < 20
200960	560	Fruits	Grape juice, unfermented, Brix value >= 20
220430	560	Fruits	Grape must nes, unfermented, other than that of heading No 20.09
220421	560	Fruits	Grape wines nes,incl fort&grape must,unfermntd by add alc in ctrn<=2l
220429	560	Fruits	Grape wines nes,incl fort&grape must,unfermntd by add alc,in ctrn > 2l
220410	560	Fruits	Grape wines, sparkling
080620	560	Fruits	Grapes, dried
080610	560	Fruits	Grapes, fresh
220820	560	Fruits	Spirits obtained by distilling grape wine or grape marc
220510	560	Fruits	Vermouth&oth grape wines flav w plants o arom subst in ctrn <= 2 l
220590	560	Fruits	Vermouth&oth grape wines flav with plants or arom subst in ctrn > 2 l
080711	567	Fruits	Watermelons
080711	567	Fruits	Watermelons, fresh
080719	568	Fruits	Other melons (inc.cantaloupes)
080719	568	Fruits	Melons, fresh, other than watermelons
080420	569	Fruits	Figs, fresh or dried
080420	569	Fruits	Figs, fresh or dried
080450	571	Fruits	Guavas, mangoes and mangosteens, fresh or dried
080450	571	Fruits	Guavas, mangoes and mangosteens, fresh or dried
080440	572	Fruits	Avocados, fresh or dried
080440	572	Fruits	Avocados, fresh or dried
080430	574	Fruits	Pineapples, fresh or dried
200940	574	Fruits	Pineapple juice,unfermented¬ spirtd,whether or not sugard or sweet

Product code (HS)	(FAO)	Crop category	Product description (HS)
200940	574	Fruits	Pineapple juice, unfermented, Brix value < 20
200940	574	Fruits	Pineapple juice, unfermented, Brix value >= 20
200940	574	Fruits	Pineapple juice, unfermented, Brix value < 20
200940	574	Fruits	Pineapple juice, unfermented, Brix value >= 20
080430	574	Fruits	Pineapples, fresh or dried
080410	577	Fruits	Dates, fresh or dried
080410	577	Fruits	Dates, fresh or dried
081090ad	591	Fruits	Cashewapple
081050	592	Fruits	Kiwi fruit
081050	592	Fruits	Kiwifruit, fresh
080720	600	Fruits	Papaws (papayas), fresh
080720	600	Fruits	Papaws (papayas), fresh
080450_b	603	Fruits	Fruit, tropical fresh nes
081090	619	Fruits	Fruits, fresh nes
081340	619	Fruits	Fruits, dried nes
081090	619	Fruits	Fresh Durians
081090	619	Fruits	Fresh Durians
081090	619	Fruits	Fruit mixtures nes,o/w prep o presvd,whether o not sugard,sweet o spir
081090	619	Fruits	Fruit,nut,fruit-peel&pts of plant presvd by sugar (draind,glace/cryst)
081090	619	Fruits	Fruits&edible nuts uncook,steam/boil (water) sweetend/not,frozen,nes
081340	619	Fruits	Fruits, dried nes
081090	619	Fruits	Fruits, fresh nes
090111	656	Tea_Coffee	Coffee, not roasted, not decaffeinated
090112	656	Tea_Coffee	Coffee, not roasted, decaffeinated
090121	656	Tea_Coffee	Coffee, roasted, not decaffeinated
090122	656	Tea_Coffee	Coffee, roasted, decaffeinated
090112	656	Tea_Coffee	Coffee, not roasted, decaffeinated
090111	656	Tea_Coffee	Coffee, not roasted, not decaffeinated
090122	656	Tea_Coffee	Coffee, roasted, decaffeinated
090121	656	Tea_Coffee	Coffee, roasted, not decaffeinated
180100	661	Cocoa	Cocoa beans, whole or broken, raw or roasted
180200	661	Cocoa	Cocoa shells, husks, skins and other cocoa waste
180310	661	Cocoa	Cocoa paste not defatted
180320	661	Cocoa	Cocoa paste wholly or partly defatted
180400	661	Cocoa	Cocoa butter, fat and oil
180500	661	Cocoa	Cocoa powder, not containing added sugar or other sweetening matter
180500a	661	Cocoa	Chocolate
180610	661	Cocoa	Cocoa powder, containing added sugar or other sweetening matter
180100	661	Cocoa	Cocoa beans, whole or broken, raw or roasted
180400	661	Cocoa	Cocoa butter, fat and oil
180310	661	Cocoa	Cocoa paste not defatted
180320	661	Cocoa	Cocoa paste wholly or partly defatted
180610	661	Cocoa	Cocoa powder, containing added sugar or other sweetening matter
180500	661	Cocoa	Cocoa powder, not containing added sugar or other sweetening matter
180200	661	Cocoa	Cocoa shells, husks, skins and other cocoa waste
0902	667	Tea_Coffee	Tea
090210	667	Tea_Coffee	Green tea (not fermented) in packages not exceeding 3 kg
090220	667	Tea_Coffee	Green tea (not fermented) in packages exceeding 3 kg
090230	667	Tea_Coffee	Black tea (fermented)&partly fermentd tea in packages not exceedg 3 kg
090240	667	Tea_Coffee	Black tea (fermented) & partly fermented tea in packages exceedg 3 kg
090240	667	Tea_Coffee	Black tea (fermented) & partly fermented tea in packages exceedg 3 kg
090230	667	Tea_Coffee	Black tea (fermented)&partly fermentd tea in packages not exceedg 3 kg
090220	667	Tea_Coffee	Green tea (not fermented) in packages exceeding 3 kg
090210	667	Tea_Coffee	Green tea (not fermented) in packages not exceeding 3 kg
121010	677	Spices	Hop cones, not ground, powdered or pelleted
121020	677	Spices	Hop cones, ground, powdered or pelleted and lupulin
130213	677	Spices	Hop extract
121020	677	Spices	Hop cones, ground, powdered or pelleted and lupulin
121010	677	Spices	Hop cones, not ground, powdered or pelleted
090411	687	Spices	Pepper of the genus Piper,ex cubeb pepper,neither crushd nor ground
090412	687	Spices	Pepper of the genus Piper, except cubeb pepper, crushed or ground
090412	687	Spices	Pepper of the genus Piper, except cubeb pepper, crushed or ground
090411	687	Spices	Pepper of the genus Piper,ex cubeb pepper,neither crushd nor ground
090420	689	Spices	Fruits of the genus Capsicum or Pimenta, dried, crushed or ground
090420	689	Spices	Fruits of the genus Capsicum or Pimenta, dried, crushed or ground

Product code (HS)	(FAO)	Crop category	Product description (HS)
090500	692	Spices	Vanilla beans
090500	692	Spices	Vanilla beans
090610	693	Spices	Cinnamon and cinnamon-tree flowers neither crushed nor ground
090620	693	Spices	Cinnamon and cinnamon-tree flowers crushed or ground
090620	693	Spices	Cinnamon and cinnamon-tree flowers crushed or ground
090610	693	Spices	Cinnamon and cinnamon-tree flowers neither crushed nor ground
090700	698	Spices	Cloves (whole fruit, cloves and stems)
090700	698	Spices	Cloves (whole fruit, cloves and stems)
0908	702	Spices	Nutmeg, Mace, Cardamoms
0908	702	Spices	Nutmeg
0908	702	Spices	Mace
0908	702	Spices	Cardamoms
0908	702	Spices	Cardamoms
0908	702	Spices	Mace
0908	702	Spices	Nutmeg
090910	711	Spices	Anise or badian seeds
090920	711	Spices	Coriander seeds
090910	711	Spices	Anise or badian seeds
090920	711	Spices	Coriander seeds
091010	720	Spices	Ginger
091030	720	Spices	Turmeric (curcuma)
091050	720	Spices	Curry
091091	720	Spices	Mixtures of two/more of the prods of different headgs to this chapter
091050	720	Spices	Curry
091010	720	Spices	Ginger
091091	720	Spices	Mixtures of two/more of the prods of different headgs to this chapter
091030	720	Spices	Turmeric (curcuma)
091099	723	Spices	Spices nes
091099	723	Spices	Cumin seeds
091099	723	Spices	Caraway seeds
091099	723	Spices	Fennel or juniper seeds
091099	723	Spices	Caraway seeds
091099	723	Spices	Cumin seeds
091099	723	Spices	Fennel or juniper seeds
091099	723	Spices	Spices nes
070990_d	748	Spices	Peppermint
530110	773	FibreCrops	Flax fibre, raw or retted
530121	773	FibreCrops	Flax fibre, broken or scutched
530129	773	FibreCrops	Flax fibre, otherwise processed but not spun
530130	773	FibreCrops	Flax tow and waste (including yarn waste and garnetted stock)
530121	773	FibreCrops	Flax fibre, broken or scutched
530129	773	FibreCrops	Flax fibre, otherwise processed but not spun
530110	773	FibreCrops	Flax fibre, raw or retted
530130	773	FibreCrops	Flax tow and waste (including yarn waste and garnetted stock)
530129	773	FibreCrops	Table linen, of flax, not knitted
530129	773	FibreCrops	Toilet and kitchen linen, of flax
530129	773	FibreCrops	Woven fabrics of flax,containg <85% by weight of flax,unbleached or bl
530129	773	FibreCrops	Woven fabrics of flax,containing <85% by weight of flax,o/t unbl or bl
530210	777	FibreCrops	True hemp fibre (Cannabis sativa l), raw or retted
530290	777	FibreCrops	True hemp fibre otherwise processd but not spun;tow&waste of true hemp
530210	777	FibreCrops	True hemp fibre (Cannabis sativa l), raw or retted
530290	777	FibreCrops	True hemp fibre otherwise processd but not spun;tow&waste of true hemp
530310	780	FibreCrops	Jute and other textile bast fibres, raw or retted
530390	780	FibreCrops	Jute and other tex bast fib,not spun,nes;tow and waste of these fibres
530390	780	FibreCrops	Jute and other tex bast fib,not spun,nes;tow and waste of these fibres
530310	780	FibreCrops	Jute and other textile bast fibres, raw or retted
530310	780	FibreCrops	Woven fabrics of jute or of other textile bast fibres, o/t unbleached
530310	780	FibreCrops	Woven fabrics of jute or of other textile bast fibres, unbleached
5303ab	782	FibreCrops	Other Bastfibres
530590b	788	FibreCrops	Ramie & other vegetable textile fibers, raw or processed but not spun; tow, noils & waste of these fibres
5304_b	789	FibreCrops	Sisal
530410	789	FibreCrops	Sisal and other textile fibres of the genus Agave, raw
530490	789	FibreCrops	Sisal textile fibres processed but not spun;tow&waste of sisal fibres

Product code (HS)	(FAO)	Crop category	Product description (HS)
530410	789	FibreCrops	Sisal and other textile fibres of the genus Agave, raw
530490	789	FibreCrops	Sisal textile fibres processed but not spun; tow & waste of sisal fibres
5304c	800	FibreCrops	Agave Fibres Nes
530521	809	FibreCrops	Abaca fibre, raw
530529	809	FibreCrops	Abaca fibre, processed but not spun; tow, noils and waste of abaca fibres
530521	809	FibreCrops	Abaca fibre, raw
530529	809	FibreCrops	Abaca fibre, processed but not spun; tow, noils and waste of abaca fibres
530590a	821	FibreCrops	Fibre Crops Nes
530591	821	FibreCrops	Vegetable textile fibres nes, raw
530599	821	FibreCrops	Vegetable tex fib nes, processed nt spun; tow, noils & waste of these fibres
240110	826	Tobacco	Tobacco, unmanufactured, not stemmed or stripped
240120	826	Tobacco	Tobacco, unmanufactured, partly or wholly stemmed or stripped
240130	826	Tobacco	Tobacco refuse
240120	826	Tobacco	Cigars, cheroots and cigarillos, containing tobacco
240120	826	Tobacco	Cigarettes containing tobacco
240120	826	Tobacco	Cigarettes containing tobacco
240120	826	Tobacco	Cigars, cheroots and cigarillos, containing tobacco
240120	826	Tobacco	Cigars, cheroots, cigarillos and cigarettes, cntg tobacco substitutes
240130	826	Tobacco	Tobacco refuse
240110	826	Tobacco	Tobacco, unmanufactured, not stemmed or stripped
240120	826	Tobacco	Tobacco, unmanufactured, partly or wholly stemmed or stripped
400110	836	Tobacco	Natural rubber

9.8 Appendix H: List of internationally traded industrial product categories in the study

HS Code	Product description - ITC
26	Ores, slag and ash
27	Mineral fuels, oils, distillation products, etc
28	Inorganic chemicals, precious metal compound, isotopes
70	Glass and glassware
71	Pearls, precious stones, metals, coins, etc
72	Iron and steel
73	Articles of iron or steel
74	Copper and articles thereof
75	Nickel and articles thereof
76	Aluminum and articles thereof
78	Lead and articles thereof
79	Zinc and articles thereof
80	Tin and articles thereof
81	Other base metals, cermet's, articles thereof
82	Tools, implements, cutlery, etc of base metal
83	Miscellaneous articles of base metal
84	Nuclear reactors, boilers, machinery, etc
85	Electrical, electronic equipment
86	Railway, tramway locomotives, rolling stock, equipment
87	Vehicles other than railway, tramway
88	Aircraft, spacecraft, and parts thereof
89	Ships, boats and other floating structures
96	Miscellaneous manufactured articles

9.9 Appendix I: Feed composition per animal type

Beef										
Feed	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czech Republic	Denmark	Estonia	Finland	France
Apples and products		0.0008								
Barley and products	0.2937	0.1416	0.1508	0.1242	0.3779	0.1309	0.2061	0.8516	0.3668	0.0845
Beans			0.0082	0.0393		0.0047		0.0034		
Brans	0.0586	0.1383	0.2558	0.0925	0.0324	0.0272	0.0113	0.0922	0.0311	0.0356
Cassava and products	0.0001	0.0322	0.0012			0.0001	0.0000		0.0175	0.0014
Cereals, Other	0.2328	0.0131	0.0234	0.0172	0.0010	0.0291	0.0169	0.0846	0.0066	0.0467
Coconuts - Incl Copra								0.0001		
Copra Cake		0.0019	0.0000		0.0000	0.0000	0.0000		0.0000	0.0000
Cottonseed					0.0002					
Cottonseed Cake	0.0006	0.0002	0.0002					0.0001	0.0000	0.0000
Fruits, Other		0.0015								
Groundnut Cake		0.0003	0.0060			0.0006	0.0001			0.0009
Groundnuts (in Shell Eq)								0.0032		
Groundnuts (Shelled Eq)								0.0022		
Maize and products	0.5810	0.1780	0.4004	1.3483	0.2417	0.0866	0.0073	0.0414	0.0007	0.1376
Millet and products	0.0013	0.0048	0.0030	0.0003	0.0003	0.0001	0.0002	0.0001	0.0000	0.0004
Molasses	0.1235	0.0694	0.1192	0.4014	0.0323	0.1878	0.1727	0.1023		0.0092
Oats	0.0391	0.0157	0.0218	0.0512	0.0004	0.0182	0.0229	0.2047	0.1927	0.0076
Oilcrops Oil, Other									0.0000	
Oilcrops, Other	0.0032	0.0067	0.0025	0.0017	0.0001	0.0065	0.0004	0.0432	0.0003	0.0007
Oilseed Cakes, Other	0.0054	0.0263	0.0156	0.0182	0.0001	0.0008	0.0005	0.0030	0.0000	0.0025
Olive Oil					0.0001					
Palmkernel Cake	0.0014	0.0205		0.0000		0.0001	0.0012	0.0001	0.0008	0.0018
Peas	0.1378	0.0236	0.0034			0.0389	0.0226	0.0543	0.1030	0.0376
Potatoes and products	0.0480	0.1995	0.0541	0.0483	0.0890	0.0857	0.0297	0.2981	0.0173	0.0401
Pulses, Other and products	0.0847	0.0009	0.0134	0.0229	0.0014	0.0400	0.0075	0.0010	0.0015	0.0143
Rape and Mustard Cake	0.0922	0.0390	0.0043	0.0252	0.0015	0.0903	0.0262	0.3050	0.1305	0.0433
Rape and Mustardseed	0.0003	0.0512				0.0120	0.0107	0.0672		0.0043
Rice (Milled Equivalent)		0.0106	0.0037		0.0001	0.0004	0.0002			0.0020
Rice (Paddy Equivalent)		0.0159	0.0055		0.0002	0.0006	0.0003			0.0030
Roots, Other		0.0012	0.0000		0.0090		0.0002	0.0133	0.0002	0.0006
Rye and products	0.0365	0.0042	0.0045	0.0027		0.0006	0.0070	0.0115	0.0001	0.0019
Sesame seed								0.0005		
Sesameseed Cake		0.0001			0.0000	0.0002	0.0001			0.0001
Sorghum and products	0.0000	0.0211	0.0049	0.0010	0.0051	0.0000	0.0033			0.0066
Soyabean Cake	0.2595	0.1311	0.1472	0.4068	0.1492	0.1891	0.1233	0.1058	0.0741	0.0766
Soyabean Oil	0.0010	0.0037								
Soyabeans	0.0449	0.0404		0.0095	0.0007		0.0017	0.0043		0.0032
Sugar & Sweeteners	0.0130		0.0032				0.0013	0.0063	0.0077	0.0071
Sugar beet			0.0005	0.0254				0.0024		
Sugar cane						0.0000				
Sunflower seed	0.0075		0.1189	0.0010		0.0013	0.0015	0.0053		0.0043
Sunflowerseed Cake	0.0184	0.0156	0.1390	0.0737	0.0477	0.0092	0.0166	0.0212	0.0049	0.0162
Sweet potatoes		0.0001								0.0009
Sweeteners, Other										0.0041
Vegetable Oils		0.0037								
Vegetables, Other	0.0003	0.0463	0.2091	0.1054	0.0410	0.0030	0.0001		0.0165	0.0125
Wheat and products	0.2088	0.2655	0.5716	0.1499	0.0065	0.2699	0.3322	0.5847	0.1039	0.1874

Beef										
Country	Germany	Greece	Hungary	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands
Apples and products		0.0054	0.0024				0.0020	0.1183		
Barley and products	0.1736	0.0700	0.1154	0.2190	0.0444	0.1238	0.2192	0.1931	0.2652	0.1032
Beans	0.0012	0.0007		0.0161		0.0053	0.0064			0.0053
Brans	0.0351	0.0595	0.0431	0.0381	0.1112	0.0483	0.0319	0.0263	0.0809	0.0555
Cassava and products	0.0084	0.0009		0.0002	0.0053		0.0017	0.0025	0.0063	0.0527
Cereals, Other	0.0464	0.0037	0.0680	0.0017	0.0017	0.0359	0.1252	0.1480	0.0081	0.0135
Coconuts - Incl Copra							0.0001			
Copra Cake	0.0000	0.0000		0.0000	0.0000	0.0000		0.0002		0.0010
Cottonseed					0.0001					
Cottonseed Cake	0.0000	0.0194	0.0003	0.0002	0.0026				0.0073	0.0000
Fruits, Other		0.0032						0.0078		
Groundnut Cake	0.0001	0.0010		0.0000	0.0002	0.0000				0.0046
Maize and products	0.0907	0.3732	0.5681	0.0433	0.3369	0.0110	0.0364	0.0351	0.4020	0.2251
Millet and products	0.0002	0.0000	0.0030	0.0000	0.0003	0.0001	0.0000	0.0000	0.0004	0.0009
Molasses	0.0616	0.0200	0.0151		0.0106	0.0069	0.0018		0.0379	0.0385
Oats	0.0144	0.0222	0.0246	0.0205	0.0100	0.0763	0.0436	0.0097	0.0029	0.0049
Oilcrops, Other	0.0004	0.0013	0.0020	0.0081	0.0000	0.0078	0.0127	0.0038	0.0020	
Oilseed Cakes, Other	0.0011	0.0024	0.0051	0.0007	0.0037	0.0022	0.0009	0.0140	0.0021	0.0016
Onions			0.0041							
Palm kernels						0.0000				
Palmkernel Cake	0.0075		0.0001	0.0209	0.0001		0.0005	0.0221		0.0666
Peas	0.0340	0.0007	0.0113	0.0050	0.0081	0.0052	0.0120	0.0587		0.0200
Potatoes and products	0.0387	0.0516	0.0395	0.0092	0.0082	0.2051	0.1818	0.1461		0.1677
Pulses, Other and products	0.0182	0.0097	0.0005		0.0103	0.0002	0.0298	0.0163	0.2347	0.0012
Rape and Mustard Cake	0.0534	0.0029	0.0057	0.0325	0.0045	0.0652	0.0002	0.1571		0.0831
Rape and Mustard Oil	0.0152									
Rape and Mustardseed	0.0016	0.0006				0.0539	0.0948	0.0128	0.0001	0.0207
Rice (Milled Equivalent)	0.0006	0.0014	0.0013		0.0008	0.0001	0.0001	0.0019		0.0050
Rice (Paddy Equivalent)	0.0009	0.0021	0.0019		0.0011	0.0001	0.0002	0.0028		0.0074
Roots, Other	0.0002	0.0001	0.0001	0.0015	0.0015			0.0035		0.0014
Rye and products	0.0391	0.0058	0.0125		0.0006	0.0348	0.0232	0.0087	0.0001	0.0071
Sesame seed							0.0002			
Sesameseed Cake	0.0003	0.0014			0.0001			0.0004		0.0001
Sesameseed Oil						0.0000				
Sorghum and products	0.0014	0.0002	0.0012	0.0018	0.0118	0.0000	0.0001	0.0001	0.0001	0.0074
Soyabean Cake	0.0885	0.1339	0.1927	0.0604	0.1284	0.0756	0.1042	0.2046	0.3877	0.2032
Soyabean Oil					0.0012			0.0010		
Soyabeans		0.0008	0.0057	0.0040	0.0027	0.0084	0.0011	0.0037	0.0007	0.0001
Sugar & Sweeteners	0.0004		0.0020				0.0104			
Sugar beet	0.0001				0.0033	0.0168	0.0009			
Sugar cane				0.0011						0.0001
Sunflower seed	0.0017		0.0091		0.0018	0.0008	0.0008			
Sunflowerseed Cake	0.0029	0.0270	0.0988	0.0163	0.0246	0.0229	0.0271	0.0023	0.0288	0.0323
Sweet potatoes	0.0004	0.0001		0.0020	0.0002					
Sweeteners, Other							0.0104			
Vegetable Oils								0.0010		
Vegetables, Other	0.0185	0.0754	0.1940	0.0830	0.0987	0.0001	0.0241	0.0005	0.0987	0.0693
Wheat and products	0.2234	0.0975	0.2260	0.1533	0.0519	0.2071	0.1234	0.3275		0.3248

Beef								
Country	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	United Kingdom
Apples and products			0.0193			0.0025		
Bananas		0.0063						
Barley and products	0.0876	0.0254	0.0231	0.0666	0.1062	0.1039	0.1119	0.0697
Beans		0.0070	0.0004	0.0215	0.0034	0.0000		0.0104
Brans	0.0328	0.0233	0.0618	0.0863	0.0555	0.0161	0.0207	0.0266
Cassava and products	0.0000	0.0342	0.0000	0.0002	0.0000	0.0245	0.0001	0.0033
Cereals, Other	0.2382	0.0042	0.0080	0.0158	0.0315	0.0026	0.0363	0.0016
Copra Cake	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cottonseed				0.0020		0.0012		
Cottonseed Cake	0.0000	0.0011	0.0000		0.0000	0.0009		0.0000
Fruits, Other			0.0222			0.0036		
Groundnut Cake	0.0012	0.0005	0.0002	0.0003		0.0000		0.0000
Maize and products	0.0702	0.2133	0.5041	0.3053	0.4088	0.0881	0.0026	0.0004
Millet and products	0.0004	0.0003	0.0003	0.0004	0.0007	0.0001	0.0000	0.0003
Molasses	0.0094	0.0139	0.0085	0.0442	0.0231	0.0151	0.0257	0.0290
Oats	0.0369	0.0064	0.0197	0.0109	0.0091	0.0120	0.0681	0.0046
Oilcrops Oil, Other					0.0050			
Oilcrops, Other	0.0005	0.0009	0.0017	0.0050	0.0007	0.0013	0.0267	0.0007
Oilseed Cakes, Other	0.0038	0.0032	0.0006	0.0025	0.0045	0.0009	0.0021	0.0024
Palmkernel Cake	0.0028	0.0118	0.0002	0.0001		0.0023	0.0140	0.0141
Peas			0.0086	0.2255		0.0242	0.0128	
Potatoes and products	0.2389	0.0363	0.1834	0.0291	0.1473	0.0197	0.0530	0.0017
Pulses, Other and products	0.0226	0.0221	0.0000	0.0598	0.0045	0.0150	0.0004	0.0640
Rape and Mustard Cake	0.0738	0.0189	0.0243	0.1054	0.0710	0.0113	0.0581	0.0270
Rape and Mustardseed			0.0015	0.0109			0.0057	0.0064
Rice (Milled Equivalent)	0.0003			0.0030	0.0005	0.0000	0.0000	0.0003
Rice (Paddy Equivalent)	0.0004			0.0046	0.0007	0.0000	0.0001	0.0004
Roots, Other				0.0001	0.1266	0.0016	0.0005	0.0030
Rye and products	0.0272	0.0001	0.0002	0.0002	0.0009	0.0042	0.0033	0.0004
Sesameseed Cake	0.0006	0.0000			0.0002			
Sorghum and products	0.0003	0.0026	0.0012	0.0000	0.0002	0.0087	0.0000	0.0006
Soyabean Cake	0.2192	0.1198	0.2533	0.2082	0.1836	0.1324	0.0717	0.0618
Soyabeans		0.0074	0.0054			0.0018		0.0033
Sugar & Sweeteners	0.0016							
Sugar beet			0.0109		0.0012		0.0830	
Sugar cane								0.0000
Sunflower seed				0.0113	0.0036	0.0028		0.0016
Sunflowerseed Cake	0.0534	0.0178	0.0900	0.0588	0.1128	0.0156	0.0027	0.0097
Sweet potatoes		0.0177			0.0002	0.0002		0.0067
Tomatoes and products						0.0149		
Vegetables, Other	0.0034	0.0165	0.0540	0.0004	0.0003	0.0285	0.0097	0.0103
Wheat and products	0.1155	0.0521	0.0557	0.2757	0.0654	0.0682	0.1231	0.1400

Swine										
Country	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czech Republic	Denmark	Estonia	Finland	France
Apples and products		0.0012								
Barley and products	0.5419	0.2591	0.2668	0.1522	1.3720	0.3070	0.9078	1.1743	1.3985	0.4410
Beans			0.0121	0.0403		0.0091		0.0040		
Brans	0.1080	0.2531	0.4525	0.1133	0.1175	0.0637	0.0498	0.1271	0.1184	0.1856
Cassava and products	0.0001	0.0492	0.0017			0.0002	0.0000		0.0557	0.0060
Cereals, Other	0.4295	0.0239	0.0415	0.0211	0.0035	0.0684	0.0744	0.1166	0.0251	0.2437
Coconuts - Incl Copra								0.0001		
Copra Cake		0.0032	0.0000		0.0000	0.0000	0.0000		0.0000	0.0001
Cottonseed					0.0007					
Cottonseed Cake	0.0011	0.0004	0.0003					0.0001	0.0000	0.0001
Fruits, Other		0.0024								
Groundnut Cake		0.0004	0.0097			0.0012	0.0005			0.0041
Groundnuts (in Shell Eq)								0.0040		
Groundnuts (Shelled Eq)								0.0028		
Maize and products	1.0719	0.3257	0.7085	1.6523	0.8773	0.2031	0.0322	0.0571	0.0028	0.7180
Millet and products	0.0023	0.0087	0.0054	0.0004	0.0010	0.0003	0.0010	0.0001	0.0000	0.0019
Molasses	0.1905	0.1063	0.1764	0.4114	0.0982	0.3683	0.6362	0.1180		0.0401
Oats	0.0722	0.0286	0.0385	0.0628	0.0013	0.0426	0.1010	0.2823	0.7348	0.0395
Oilcrops Oil, Other									0.0000	
Oilcrops, Other	0.0053	0.0111	0.0040	0.0019	0.0004	0.0138	0.0015	0.0542	0.0009	0.0035
Oilseed Cakes, Other	0.0090	0.0437	0.0250	0.0203	0.0002	0.0018	0.0019	0.0038	0.0000	0.0119
Olive Oil					0.0003					
Palmkernel Cake	0.0024	0.0341		0.0000		0.0002	0.0048	0.0001	0.0028	0.0084
Peas	0.2126	0.0362	0.0051			0.0763	0.0832	0.0627	0.3284	0.1639
Potatoes and products	0.0740	0.3053	0.0801	0.0495	0.2702	0.1680	0.1093	0.3438	0.0553	0.1748
Pulses, Other and products	0.1307	0.0014	0.0199	0.0234	0.0041	0.0785	0.0278	0.0012	0.0049	0.0622
Rape and Mustard Cake	0.1546	0.0649	0.0069	0.0281	0.0048	0.1925	0.1051	0.3823	0.4522	0.2054
Rape and Mustardseed	0.0005	0.0852				0.0255	0.0430	0.0842		0.0204
Rice (Milled Equivalent)		0.0195	0.0065		0.0005	0.0010	0.0008			0.0104
Rice (Paddy Equivalent)		0.0292	0.0097		0.0008	0.0015	0.0012			0.0155
Roots, Other		0.0018	0.0000		0.0272		0.0007	0.0153	0.0008	0.0028
Rye and products	0.0673	0.0077	0.0080	0.0033		0.0015	0.0307	0.0158	0.0005	0.0100
Sesame seed								0.0007		
Sesameseed Cake		0.0002			0.0001	0.0004	0.0002			0.0004
Sorghum and products	0.0000	0.0386	0.0087	0.0012	0.0184	0.0000	0.0146			0.0342
Soyabean Cake	0.4353	0.2181	0.2367	0.4532	0.4924	0.4032	0.4936	0.1326	0.2569	0.3634
Soyabean Oil	0.0018	0.0062								
Soyabeans	0.0753	0.0672		0.0106	0.0022		0.0069	0.0053		0.0153
Sugar & Sweeteners	0.0201		0.0047				0.0047	0.0073	0.0244	0.0310
Sugar beet			0.0007	0.0260				0.0028		
Sugar cane						0.0001				
Sunflower seed	0.0125		0.1913	0.0011		0.0029	0.0061	0.0067		0.0205
Sunflowerseed Cake	0.0309	0.0259	0.2235	0.0821	0.1576	0.0197	0.0665	0.0266	0.0171	0.0768
Sweet potatoes		0.0002								0.0040
Sweeteners, Other										0.0177
Vegetable Oils		0.0062								
Vegetables, Other	0.0004	0.0709	0.3095	0.1081	0.1244	0.0060	0.0004		0.0528	0.0545
Wheat and products	0.3852	0.4857	1.0113	0.1837	0.0235	0.6328	1.4632	0.8062	0.3962	0.9780

Swine										
Country	Germany	Greece	Hungary	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands
Apples and products		0.0191	0.0049				0.0037	0.1794		
Bananas										
Barley and products	0.7430	0.2950	0.2794	1.2276	0.2084	0.3114	0.4812	0.3500	0.4937	0.1910
Beans	0.0043	0.0025		0.0755		0.0112	0.0117			0.0082
Brans	0.1502	0.2506	0.1043	0.2133	0.5217	0.1215	0.0700	0.0477	0.1505	0.1026
Cassava and products	0.0299	0.0033		0.0008	0.0206		0.0032	0.0038	0.0099	0.0816
Cereals, Other	0.1984	0.0157	0.1647	0.0096	0.0081	0.0903	0.2749	0.2683	0.0151	0.0251
Coconuts - Incl Copra							0.0001			
Copra Cake	0.0001	0.0000		0.0002	0.0002	0.0000		0.0003		0.0016
Cottonseed					0.0003					
Cottonseed Cake	0.0000	0.0744	0.0007	0.0011	0.0110				0.0124	0.0000
Fruits, Other		0.0114						0.0119		
Groundnut Cake	0.0002	0.0038		0.0001	0.0008	0.0000				0.0078
Maize and products	0.3881	1.5720	1.3758	0.2426	1.5814	0.0276	0.0799	0.0637	0.7483	0.4166
Millet and products	0.0008	0.0001	0.0072	0.0001	0.0014	0.0002	0.0001	0.0001	0.0008	0.0017
Molasses	0.2206	0.0705	0.0305		0.0415	0.0145	0.0034		0.0591	0.0595
Oats	0.0615	0.0936	0.0596	0.1148	0.0467	0.1918	0.0957	0.0176	0.0054	0.0091
Oilcrops, Other	0.0014	0.0048	0.0044	0.0410	0.0001	0.0179	0.0254	0.0062	0.0033	
Oilseed Cakes, Other	0.0044	0.0090	0.0113	0.0038	0.0160	0.0050	0.0018	0.0230	0.0036	0.0026
Onions			0.0082							
Palm kernels						0.0000				
Palmkernel Cake	0.0294		0.0001	0.1065	0.0005		0.0010	0.0364		0.1120
Peas	0.1218	0.0026	0.0228	0.0232	0.0318	0.0110	0.0221	0.0891		0.0309
Potatoes and products	0.1386	0.1818	0.0800	0.0432	0.0323	0.4314	0.3338	0.2215		0.2596
Pulses, Other and products	0.0651	0.0343	0.0011		0.0404	0.0004	0.0547	0.0248	0.3654	0.0019
Rape and Mustard Cake	0.2076	0.0112	0.0125	0.1657	0.0190	0.1490	0.0004	0.2588		0.1397
Rape and Mustard Oil	0.0590									
Rape and Mustardseed	0.0062	0.0023				0.1233	0.1892	0.0211	0.0002	0.0348
Rice (Milled Equivalent)	0.0027	0.0060	0.0031		0.0036	0.0002	0.0003	0.0034		0.0092
Rice (Paddy Equivalent)	0.0041	0.0090	0.0046		0.0054	0.0003	0.0005	0.0050		0.0138
Roots, Other	0.0006	0.0002	0.0002	0.0068	0.0057			0.0053		0.0021
Rye and products	0.1673	0.0246	0.0302		0.0028	0.0875	0.0510	0.0158	0.0001	0.0131
Sesame seed							0.0005			
Sesameseed Cake	0.0010	0.0054			0.0005			0.0007		0.0002
Sesameseed Oil						0.0000				
Sorghum and products	0.0061	0.0007	0.0028	0.0103	0.0552	0.0000	0.0002	0.0001	0.0003	0.0136
Soyabean Cake	0.3445	0.5127	0.4241	0.3077	0.5480	0.1729	0.2080	0.3371	0.6560	0.3419
Soyabean Oil					0.0049			0.0016		
Soyabeans		0.0030	0.0126	0.0204	0.0114	0.0193	0.0021	0.0061	0.0012	0.0001
Sugar & Sweeteners	0.0015		0.0041				0.0191			
Sugar beet	0.0004				0.0131	0.0354	0.0016			
Sugar cane				0.0053						0.0001
Sunflower seed	0.0065		0.0201		0.0076	0.0019	0.0016			
Sunflowerseed Cake	0.0113	0.1036	0.2175	0.0831	0.1052	0.0525	0.0541	0.0038	0.0488	0.0543
Sweet potatoes	0.0014	0.0005		0.0094	0.0009					
Sweeteners, Other							0.0191			
Vegetable Oils								0.0016		
Vegetables, Other	0.0662	0.2655	0.3930	0.3889	0.3873	0.0001	0.0442	0.0008	0.1537	0.1072
Wheat and products	0.9563	0.4108	0.5472	0.8591	0.2434	0.5208	0.2708	0.5937		0.6011

Swine								
Country	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	United Kingdom
Apples and products			0.0325			0.0094		
Bananas		0.0225						
Barley and products	0.1890	0.1077	0.0464	0.1186	0.1786	0.4699	0.4208	0.4035
Beans		0.0247	0.0006	0.0320	0.0047	0.0000		0.0505
Brans	0.0709	0.0986	0.1240	0.1538	0.0933	0.0730	0.0779	0.1542
Cassava and products	0.0000	0.1212	0.0000	0.0003	0.0000	0.0926	0.0004	0.0159
Cereals, Other	0.5141	0.0177	0.0160	0.0281	0.0530	0.0119	0.1364	0.0092
Copra Cake	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
Cottonseed				0.0033		0.0049		
Cottonseed Cake	0.0001	0.0041	0.0000		0.0000	0.0035		0.0000
Fruits, Other			0.0372			0.0136		
Groundnut Cake	0.0024	0.0019	0.0003	0.0006		0.0001		0.0000
Maize and products	0.1515	0.9035	1.0121	0.5440	0.6873	0.3987	0.0098	0.0025
Millet and products	0.0009	0.0015	0.0006	0.0007	0.0011	0.0005	0.0001	0.0019
Molasses	0.0170	0.0494	0.0142	0.0659	0.0324	0.0570	0.0808	0.1402
Oats	0.0796	0.0269	0.0395	0.0193	0.0153	0.0545	0.2561	0.0268
Oilcrops Oil, Other					0.0077			
Oilcrops, Other	0.0010	0.0036	0.0031	0.0082	0.0010	0.0054	0.0914	0.0035
Oilseed Cakes, Other	0.0075	0.0121	0.0012	0.0041	0.0069	0.0036	0.0072	0.0127
Palmkernel Cake	0.0055	0.0454	0.0003	0.0001		0.0093	0.0479	0.0744
Peas			0.0145	0.3361		0.0916	0.0402	
Potatoes and products	0.4313	0.1286	0.3080	0.0434	0.2071	0.0745	0.1669	0.0083
Pulses, Other and products	0.0408	0.0782	0.0000	0.0891	0.0064	0.0567	0.0012	0.3096
Rape and Mustard Cake	0.1449	0.0729	0.0444	0.1707	0.1086	0.0463	0.1988	0.1419
Rape and Mustardseed			0.0027	0.0177			0.0193	0.0335
Rice (Milled Equivalent)	0.0006			0.0054	0.0008	0.0001	0.0002	0.0016
Rice (Paddy Equivalent)	0.0009			0.0081	0.0012	0.0001	0.0002	0.0024
Roots, Other				0.0002	0.1780	0.0059	0.0017	0.0144
Rye and products	0.0587	0.0006	0.0004	0.0004	0.0015	0.0190	0.0125	0.0023
Sesameseed Cake	0.0011	0.0000			0.0003			
Sorghum and products	0.0006	0.0111	0.0024	0.0001	0.0003	0.0392	0.0000	0.0034
Soyabean Cake	0.4301	0.4614	0.4623	0.3373	0.2807	0.5446	0.2451	0.3253
Soyabeans		0.0284	0.0099			0.0074		0.0173
Sugar & Sweeteners	0.0029							
Sugar beet			0.0184		0.0017		0.2612	
Sugar cane								0.0000
Sunflower seed				0.0183	0.0055	0.0115		0.0083
Sunflowerseed Cake	0.1048	0.0685	0.1642	0.0952	0.1724	0.0642	0.0093	0.0512
Sweet potatoes		0.0626			0.0003	0.0006		0.0323
Tomatoes and products						0.0563		
Vegetables, Other	0.0061	0.0583	0.0907	0.0006	0.0005	0.1080	0.0306	0.0498
Wheat and products	0.2493	0.2206	0.1118	0.4913	0.1100	0.3087	0.4629	0.8099

Country	Poultry									
	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czech Republic	Denmark	Estonia	Finland	France
Apples and products		0.0004								
Barley and products	0.4406	0.2107	0.2907	0.1204	1.5357	0.3793	0.7385	1.2502	1.1369	0.3587
Beans			0.0058	0.0141		0.0050		0.0019		
Brans	0.0878	0.2059	0.4931	0.0896	0.1315	0.0788	0.0405	0.1353	0.0963	0.1509
Cassava and products	0.0001	0.0177	0.0008			0.0001	0.0000		0.0200	0.0021
Cereals, Other	0.3492	0.0195	0.0452	0.0167	0.0040	0.0845	0.0606	0.1242	0.0204	0.1982
Coconuts - Incl Copra								0.0001		
Copra Cake		0.0019	0.0000		0.0000	0.0000	0.0000		0.0000	0.0001
Cottonseed					0.0006					
Cottonseed Cake	0.0006	0.0002	0.0002					0.0001	0.0000	0.0001
Fruits, Other		0.0008								
Groundnut Cake		0.0003	0.0078			0.0011	0.0003			0.0024
Groundnuts (in Shell Eq)								0.0031		
Groundnuts (Shelled Eq)								0.0022		
Maize and products	0.8715	0.2649	0.7721	1.3069	0.9820	0.2509	0.0262	0.0608	0.0023	0.5839
Millet and products	0.0019	0.0071	0.0059	0.0003	0.0012	0.0003	0.0008	0.0001	0.0000	0.0015
Molasses	0.0684	0.0382	0.0849	0.1436	0.0485	0.2009	0.2285	0.0555		0.0144
Oats	0.0587	0.0233	0.0420	0.0496	0.0015	0.0527	0.0822	0.3005	0.5973	0.0322
Oilcrops Oil, Other									0.0000	
Oilcrops, Other	0.0032	0.0066	0.0032	0.0011	0.0003	0.0125	0.0009	0.0423	0.0005	0.0021
Oilseed Cakes, Other	0.0054	0.0261	0.0200	0.0118	0.0002	0.0016	0.0011	0.0029	0.0000	0.0071
Olive Oil					0.0002					
Palmkernel Cake	0.0014	0.0204		0.0000		0.0002	0.0029	0.0001	0.0017	0.0050
Peas	0.0763	0.0130	0.0024			0.0416	0.0299	0.0294	0.1179	0.0588
Potatoes and products	0.0266	0.1096	0.0385	0.0173	0.1335	0.0917	0.0392	0.1616	0.0198	0.0628
Pulses, Other and products	0.0469	0.0005	0.0096	0.0082	0.0020	0.0428	0.0100	0.0006	0.0018	0.0223
Rape and Mustard Cake	0.0922	0.0387	0.0055	0.0163	0.0040	0.1745	0.0627	0.2985	0.2696	0.1225
Rape and Mustardseed	0.0003	0.0508				0.0231	0.0256	0.0657		0.0122
Rice (Milled Equivalent)		0.0158	0.0071		0.0006	0.0013	0.0007			0.0084
Rice (Paddy Equivalent)		0.0237	0.0106		0.0009	0.0019	0.0010			0.0126
Roots, Other		0.0006	0.0000		0.0134		0.0002	0.0072	0.0003	0.0010
Rye and products	0.0547	0.0063	0.0087	0.0026		0.0018	0.0250	0.0168	0.0004	0.0081
Sesame seed								0.0005		
Sesameseed Cake		0.0001			0.0001	0.0003	0.0001			0.0002
Sorghum and products	0.0000	0.0314	0.0095	0.0009	0.0206	0.0001	0.0118			0.0278
Soyabean Cake	0.2596	0.1301	0.1892	0.2629	0.4041	0.3654	0.2944	0.1035	0.1531	0.2167
Soyabean Oil	0.0010	0.0037								
Soyabeans	0.0449	0.0401		0.0061	0.0018		0.0041	0.0042		0.0091
Sugar & Sweeteners	0.0072		0.0022				0.0017	0.0034	0.0088	0.0111
Sugar beet			0.0003	0.0091				0.0013		
Sugar cane						0.0000				
Sunflower seed	0.0075		0.1529	0.0007		0.0026	0.0036	0.0052		0.0122
Sunflowerseed Cake	0.0184	0.0154	0.1786	0.0476	0.1293	0.0178	0.0397	0.0208	0.0102	0.0458
Sweet potatoes		0.0001								0.0014
Sweeteners, Other										0.0064
Vegetable Oils		0.0037								
Vegetables, Other	0.0002	0.0254	0.1489	0.0377	0.0615	0.0032	0.0001		0.0189	0.0196
Wheat and products	0.3132	0.3951	1.1021	0.1453	0.0263	0.7820	1.1902	0.8583	0.3221	0.7954

Poultry										
Country	Germany	Greece	Hungary	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands
Apples and products		0.0068	0.0023				0.0018	0.0644		
Barley and products	0.6040	0.2399	0.2945	0.9983	0.1695	0.3407	0.5124	0.2845	0.4015	0.1554
Beans	0.0016	0.0009		0.0271		0.0054	0.0055			0.0029
Brans	0.1221	0.2038	0.1099	0.1735	0.4243	0.1330	0.0745	0.0388	0.1224	0.0835
Cassava and products	0.0107	0.0012		0.0003	0.0074		0.0015	0.0014	0.0035	0.0293
Cereals, Other	0.1613	0.0128	0.1736	0.0078	0.0066	0.0988	0.2927	0.2181	0.0123	0.0204
Coconuts - Incl Copra							0.0001			
Copra Cake	0.0001	0.0000		0.0001	0.0001	0.0000		0.0002		0.0010
Cottonseed					0.0002					
Cottonseed Cake	0.0000	0.0444	0.0005	0.0007	0.0066				0.0074	0.0000
Fruits, Other		0.0041						0.0043		
Groundnut Cake	0.0001	0.0023		0.0000	0.0005	0.0000				0.0046
Maize and products	0.3155	1.2784	1.4503	0.1973	1.2860	0.0302	0.0850	0.0518	0.6086	0.3388
Millet and products	0.0007	0.0001	0.0076	0.0001	0.0012	0.0003	0.0001	0.0001	0.0007	0.0014
Molasses	0.0792	0.0253	0.0142		0.0149	0.0070	0.0016		0.0212	0.0214
Oats	0.0500	0.0761	0.0628	0.0933	0.0380	0.2099	0.1019	0.0143	0.0044	0.0074
Oilcrops, Other	0.0008	0.0029	0.0034	0.0245	0.0001	0.0143	0.0198	0.0037	0.0020	
Oilseed Cakes, Other	0.0026	0.0054	0.0087	0.0023	0.0095	0.0040	0.0014	0.0137	0.0022	0.0016
Onions			0.0038							
Palm kernels						0.0000				
Palmkernel Cake	0.0175		0.0001	0.0635	0.0003		0.0008	0.0217		0.0668
Peas	0.0437	0.0009	0.0106	0.0083	0.0114	0.0053	0.0104	0.0320		0.0111
Potatoes and products	0.0497	0.0653	0.0372	0.0155	0.0116	0.2084	0.1569	0.0795		0.0932
Pulses, Other and products	0.0233	0.0123	0.0005		0.0145	0.0002	0.0257	0.0089	0.1312	0.0007
Rape and Mustard Cake	0.1238	0.0067	0.0097	0.0988	0.0113	0.1195	0.0003	0.1543		0.0834
Rape and Mustard Oil	0.0352									
Rape and Mustard seed	0.0037	0.0014				0.0989	0.1478	0.0126	0.0001	0.0207
Rice (Milled Equivalent)	0.0022	0.0049	0.0032		0.0029	0.0002	0.0003	0.0027		0.0075
Rice (Paddy Equivalent)	0.0033	0.0073	0.0049		0.0044	0.0003	0.0005	0.0041		0.0112
Roots, Other	0.0002	0.0001	0.0001	0.0025	0.0021			0.0019		0.0008
Rye and products	0.1360	0.0200	0.0319		0.0023	0.0958	0.0543	0.0129	0.0001	0.0107
Sesame seed							0.0004			
Sesameseed Cake	0.0006	0.0032			0.0003			0.0004		0.0001
Sesameseed Oil						0.0000				
Sorghum and products	0.0049	0.0006	0.0030	0.0084	0.0449	0.0000	0.0002	0.0001	0.0002	0.0111
Soyabean Cake	0.2054	0.3058	0.3279	0.1835	0.3268	0.1387	0.1624	0.2010	0.3913	0.2040
Soyabean Oil					0.0030			0.0010		
Soyabeans		0.0018	0.0098	0.0122	0.0068	0.0155	0.0017	0.0037	0.0007	0.0001
Sugar & Sweeteners	0.0005		0.0019				0.0090			
Sugar beet	0.0001				0.0047	0.0171	0.0008			
Sugar cane				0.0019						0.0000
Sunflower seed	0.0039		0.0155		0.0046	0.0015	0.0013			
Sunflowerseed Cake	0.0067	0.0618	0.1682	0.0496	0.0627	0.0421	0.0422	0.0023	0.0291	0.0324
Sweet potatoes	0.0005	0.0002		0.0034	0.0003					
Sweeteners, Other							0.0090			
Vegetable Oils								0.0010		
Vegetables, Other	0.0238	0.0953	0.1829	0.1396	0.1390	0.0001	0.0208	0.0003	0.0552	0.0385
Wheat and products	0.7775	0.3340	0.5768	0.6987	0.1979	0.5699	0.2883	0.4826		0.4889

Poultry								
Country	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	United Kingdom
Apples and products			0.0149			0.0034		
Bananas		0.0081						
Barley and products	0.1717	0.0876	0.0483	0.1156	0.1413	0.3822	0.3422	0.3280
Beans		0.0089	0.0003	0.0138	0.0016	0.0000		0.0181
Brans	0.0644	0.0802	0.1292	0.1498	0.0738	0.0594	0.0633	0.1253
Cassava and products	0.0000	0.0435	0.0000	0.0001	0.0000	0.0332	0.0001	0.0057
Cereals, Other	0.4670	0.0144	0.0166	0.0274	0.0419	0.0097	0.1109	0.0075
Coconuts - Incl Copra								
Copra Cake	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
Cottonseed				0.0023		0.0029		
Cottonseed Cake	0.0001	0.0024	0.0000		0.0000	0.0021		0.0000
Fruits, Other			0.0171			0.0049		
Groundnut Cake	0.0016	0.0011	0.0003	0.0004		0.0000		0.0000
Maize and products	0.1376	0.7349	1.0546	0.5299	0.5437	0.3242	0.0080	0.0020
Millet and products	0.0009	0.0012	0.0006	0.0007	0.0009	0.0004	0.0001	0.0016
Molasses	0.0068	0.0177	0.0066	0.0284	0.0113	0.0205	0.0290	0.0503
Oats	0.0723	0.0219	0.0411	0.0188	0.0121	0.0443	0.2082	0.0218
Oilcrops Oil, Other					0.0044			
Oilcrops, Other	0.0007	0.0021	0.0023	0.0058	0.0006	0.0032	0.0545	0.0021
Oilseed Cakes, Other	0.0050	0.0072	0.0009	0.0029	0.0040	0.0022	0.0043	0.0076
Palmkernel Cake	0.0037	0.0271	0.0002	0.0001		0.0055	0.0286	0.0443
Peas			0.0067	0.1446		0.0329	0.0144	
Potatoes and products	0.1729	0.0462	0.1417	0.0187	0.0723	0.0268	0.0599	0.0030
Pulses, Other and products	0.0164	0.0281	0.0000	0.0383	0.0022	0.0204	0.0004	0.1111
Rape and Mustard Cake	0.0965	0.0435	0.0339	0.1220	0.0630	0.0276	0.1185	0.0846
Rape and Mustardseed			0.0021	0.0127			0.0115	0.0200
Rice (Milled Equivalent)	0.0005			0.0053	0.0006	0.0001	0.0001	0.0013
Rice (Paddy Equivalent)	0.0008			0.0079	0.0009	0.0001	0.0002	0.0020
Roots, Other				0.0001	0.0622	0.0021	0.0006	0.0052
Rye and products	0.0533	0.0005	0.0004	0.0004	0.0012	0.0154	0.0102	0.0019
Sesameseed Cake	0.0008	0.0000			0.0002			
Sorghum and products	0.0006	0.0090	0.0025	0.0001	0.0003	0.0319	0.0000	0.0028
Soyabean Cake	0.2865	0.2752	0.3533	0.2410	0.1628	0.3248	0.1462	0.1939
Soyabeans		0.0169	0.0076			0.0044		0.0103
Sugar & Sweeteners	0.0011							
Sugar beet			0.0084		0.0006		0.0938	
Sugar cane								0.0000
Sunflower seed				0.0131	0.0032	0.0069		0.0050
Sunflowerseed Cake	0.0698	0.0408	0.1255	0.0680	0.1000	0.0383	0.0055	0.0305
Sweet potatoes		0.0225			0.0001	0.0002		0.0116
Tomatoes and products						0.0202		
Vegetables, Other	0.0024	0.0209	0.0417	0.0003	0.0002	0.0388	0.0110	0.0179
Wheat and products	0.2264	0.1794	0.1165	0.4786	0.0870	0.2511	0.3764	0.6583

Country	Sheep									
	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czech Republic	Denmark	Estonia	Finland	France
Apples and products		0.0000								
Barley and products	0.0041	0.0019	0.0181	0.0136	0.0031	0.0209	0.0068	0.0793	0.0105	0.0033
Beans			0.0033	0.0144		0.0025		0.0011		
Brans	0.0008	0.0019	0.0307	0.0101	0.0003	0.0043	0.0004	0.0086	0.0009	0.0014
Cassava and products	0.0000	0.0015	0.0005			0.0000	0.0000		0.0017	0.0002
Cereals, Other	0.0032	0.0002	0.0028	0.0019	0.0000	0.0046	0.0006	0.0079	0.0002	0.0018
Coconuts - Incl Copra								0.0000		
Copra Cake		0.0001	0.0000		0.0000	0.0000	0.0000		0.0000	0.0000
Cottonseed					0.0000					
Cottonseed Cake	0.0000	0.0000	0.0000					0.0000	0.0000	0.0000
Fruits, Other		0.0001								
Groundnut Cake		0.0000	0.0016			0.0002	0.0000			0.0001
Groundnuts (in Shell Eq)								0.0007		
Groundnuts (Shelled Eq)								0.0005		
Maize and products	0.0080	0.0024	0.0481	0.1476	0.0020	0.0138	0.0002	0.0039	0.0000	0.0054
Millet and products	0.0000	0.0001	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Molasses	0.0057	0.0032	0.0477	0.1465	0.0009	0.0998	0.0190	0.0318		0.0012
Oats	0.0005	0.0002	0.0026	0.0056	0.0000	0.0029	0.0008	0.0191	0.0055	0.0003
Oilcrops Oil, Other									0.0000	
Oilcrops, Other	0.0001	0.0002	0.0007	0.0004	0.0000	0.0023	0.0000	0.0090	0.0000	0.0001
Oilseed Cakes, Other	0.0002	0.0008	0.0042	0.0044	0.0000	0.0003	0.0000	0.0006	0.0000	0.0002
Olive Oil					0.0000					
Palmkernel Cake	0.0000	0.0006		0.0000		0.0000	0.0001	0.0000	0.0001	0.0002
Peas	0.0063	0.0011	0.0014			0.0207	0.0025	0.0169	0.0098	0.0049
Potatoes and products	0.0022	0.0091	0.0217	0.0176	0.0024	0.0455	0.0033	0.0926	0.0016	0.0052
Pulses, Other and products	0.0039	0.0000	0.0054	0.0083	0.0000	0.0213	0.0008	0.0003	0.0001	0.0019
Rape and Mustard Cake	0.0028	0.0012	0.0011	0.0061	0.0000	0.0320	0.0019	0.0631	0.0083	0.0038
Rape and Mustardseed	0.0000	0.0016				0.0042	0.0008	0.0139		0.0004
Rice (Milled Equivalent)		0.0001	0.0004		0.0000	0.0001	0.0000			0.0001
Rice (Paddy Equivalent)		0.0002	0.0007		0.0000	0.0001	0.0000			0.0001
Roots, Other		0.0001	0.0000		0.0002		0.0000	0.0041	0.0000	0.0001
Rye and products	0.0005	0.0001	0.0005	0.0003		0.0001	0.0002	0.0011	0.0000	0.0001
Sesame seed								0.0001		
Sesameseed Cake		0.0000			0.0000	0.0001	0.0000			0.0000
Sorghum and products	0.0000	0.0003	0.0006	0.0001	0.0000	0.0000	0.0001			0.0003
Soyabean Cake	0.0080	0.0040	0.0392	0.0990	0.0027	0.0670	0.0090	0.0219	0.0047	0.0066
Soyabean Oil	0.0000	0.0001								
Soyabeans	0.0014	0.0012		0.0023	0.0000		0.0001	0.0009		0.0003
Sugar & Sweeteners	0.0006		0.0013				0.0001	0.0020	0.0007	0.0009
Sugar beet			0.0002	0.0093				0.0008		
Sugar cane						0.0000				
Sunflower seed	0.0002		0.0317	0.0002		0.0005	0.0001	0.0011		0.0004
Sunflowerseed Cake	0.0006	0.0005	0.0371	0.0179	0.0009	0.0033	0.0012	0.0044	0.0003	0.0014
Sweet potatoes		0.0000								0.0001
Sweeteners, Other										0.0005
Vegetable Oils		0.0001								
Vegetables, Other	0.0000	0.0021	0.0836	0.0385	0.0011	0.0016	0.0000		0.0016	0.0016
Wheat and products	0.0029	0.0036	0.0686	0.0164	0.0001	0.0430	0.0110	0.0545	0.0030	0.0073

Sheep										
Country	Germany	Greece	Hungary	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands
Apples and products		0.0006	0.0013				0.0011	0.0053		
Barley and products	0.0056	0.0022	0.0184	0.0092	0.0016	0.0210	0.0350	0.0026	0.0037	0.0014
Beans	0.0001	0.0001		0.0023		0.0030	0.0034			0.0002
Brans	0.0011	0.0019	0.0069	0.0016	0.0039	0.0082	0.0051	0.0004	0.0011	0.0008
Cassava and products	0.0009	0.0001		0.0000	0.0006		0.0009	0.0001	0.0003	0.0024
Cereals, Other	0.0015	0.0001	0.0109	0.0001	0.0001	0.0061	0.0200	0.0020	0.0001	0.0002
Coconuts - Incl Copra							0.0000			
Copra Cake	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000		0.0000
Cottonseed					0.0000					
Cottonseed Cake	0.0000	0.0014	0.0001	0.0000	0.0002				0.0002	0.0000
Fruits, Other		0.0003						0.0004		
Groundnut Cake	0.0000	0.0001		0.0000	0.0000	0.0000				0.0001
Maize and products	0.0029	0.0118	0.0907	0.0018	0.0118	0.0019	0.0058	0.0005	0.0056	0.0031
Millet and products	0.0000	0.0000	0.0005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Molasses	0.0066	0.0021	0.0080		0.0012	0.0039	0.0010		0.0018	0.0018
Oats	0.0005	0.0007	0.0039	0.0009	0.0003	0.0129	0.0070	0.0001	0.0000	0.0001
Oilcrops Oil, Other										
Oilcrops, Other	0.0000	0.0001	0.0007	0.0008	0.0000	0.0029	0.0045	0.0001	0.0001	
Oilseed Cakes, Other	0.0001	0.0002	0.0018	0.0001	0.0003	0.0008	0.0003	0.0004	0.0001	0.0000
Onions			0.0022							
Palm kernels						0.0000				
Palmkernel Cake	0.0005		0.0000	0.0019	0.0000		0.0002	0.0007		0.0020
Peas	0.0036	0.0001	0.0060	0.0007	0.0009	0.0029	0.0064	0.0027		0.0009
Potatoes and products	0.0041	0.0054	0.0210	0.0013	0.0010	0.1157	0.0966	0.0066		0.0077
Pulses, Other and products	0.0019	0.0010	0.0003		0.0012	0.0001	0.0158	0.0007	0.0109	0.0001
Rape and Mustard Cake	0.0038	0.0002	0.0020	0.0030	0.0003	0.0245	0.0001	0.0047		0.0026
Rape and Mustard Oil	0.0011									
Rape and Mustardseed	0.0001	0.0000				0.0203	0.0336	0.0004	0.0000	0.0006
Rice (Milled Equivalent)	0.0000	0.0000	0.0002		0.0000	0.0000	0.0000	0.0000		0.0001
Rice (Paddy Equivalent)	0.0000	0.0001	0.0003		0.0000	0.0000	0.0000	0.0000		0.0001
Roots, Other	0.0000	0.0000	0.0001	0.0002	0.0002			0.0002		0.0001
Rye and products	0.0013	0.0002	0.0020		0.0000	0.0059	0.0037	0.0001	0.0000	0.0001
Sesame seed							0.0001			
Sesameseed Cake	0.0000	0.0001			0.0000			0.0000		0.0000
Sesameseed Oil						0.0000				
Sorghum and products	0.0000	0.0000	0.0002	0.0001	0.0004	0.0000	0.0000	0.0000	0.0000	0.0001
Soyabean Cake	0.0063	0.0094	0.0684	0.0056	0.0100	0.0284	0.0369	0.0062	0.0120	0.0063
Soyabean Oil					0.0001			0.0000		
Soyabeans		0.0001	0.0020	0.0004	0.0002	0.0032	0.0004	0.0001	0.0000	0.0000
Sugar & Sweeteners	0.0000		0.0011				0.0055			
Sugar beet	0.0000				0.0004	0.0095	0.0005			
Sugar cane				0.0002						0.0000
Sunflower seed	0.0001		0.0032		0.0001	0.0003	0.0003			
Sunflowerseed Cake	0.0002	0.0019	0.0351	0.0015	0.0019	0.0086	0.0096	0.0001	0.0009	0.0010
Sweet potatoes	0.0000	0.0000		0.0003	0.0000					
Sweeteners, Other							0.0055			
Vegetable Oils								0.0000		
Vegetables, Other	0.0020	0.0079	0.1033	0.0116	0.0116	0.0000	0.0128	0.0000	0.0046	0.0032
Wheat and products	0.0072	0.0031	0.0361	0.0064	0.0018	0.0350	0.0197	0.0044		0.0045

Sheep								
Country	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	United Kingdom
Apples and products			0.0088			0.0003		
Bananas		0.0007						
Barley and products	0.0145	0.0008	0.0031	0.0081	0.0160	0.0035	0.0032	0.0030
Beans		0.0007	0.0002	0.0087	0.0017	0.0000		0.0015
Brans	0.0055	0.0007	0.0084	0.0104	0.0083	0.0005	0.0006	0.0012
Cassava and products	0.0000	0.0036	0.0000	0.0001	0.0000	0.0028	0.0000	0.0005
Cereals, Other	0.0395	0.0001	0.0011	0.0019	0.0047	0.0001	0.0010	0.0001
Copra Cake	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cottonseed				0.0005		0.0001		
Cottonseed Cake	0.0000	0.0001	0.0000		0.0000	0.0001		0.0000
Fruits, Other			0.0101			0.0004		
Groundnut Cake	0.0004	0.0000	0.0001	0.0001		0.0000		0.0000
Maize and products	0.0117	0.0068	0.0687	0.0370	0.0614	0.0030	0.0001	0.0000
Millet and products	0.0001	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000	0.0000
Molasses	0.0052	0.0015	0.0039	0.0179	0.0116	0.0017	0.0024	0.0042
Oats	0.0061	0.0002	0.0027	0.0013	0.0014	0.0004	0.0019	0.0002
Oilcrops Oil, Other					0.0017			
Oilcrops, Other	0.0002	0.0001	0.0005	0.0014	0.0002	0.0001	0.0017	0.0001
Oilseed Cakes, Other	0.0014	0.0002	0.0002	0.0007	0.0015	0.0001	0.0001	0.0002
Palmkernel Cake	0.0010	0.0008	0.0000	0.0000		0.0002	0.0009	0.0014
Peas			0.0039	0.0910		0.0027	0.0012	
Potatoes and products	0.1322	0.0038	0.0834	0.0117	0.0738	0.0022	0.0050	0.0002
Pulses, Other and products	0.0125	0.0023	0.0000	0.0241	0.0023	0.0017	0.0000	0.0092
Rape and Mustard Cake	0.0272	0.0013	0.0074	0.0284	0.0237	0.0008	0.0036	0.0026
Rape and Mustardseed			0.0005	0.0029			0.0004	0.0006
Rice (Milled Equivalent)	0.0000			0.0004	0.0001	0.0000	0.0000	0.0000
Rice (Paddy Equivalent)	0.0001			0.0006	0.0001	0.0000	0.0000	0.0000
Roots, Other				0.0001	0.0634	0.0002	0.0001	0.0004
Rye and products	0.0045	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0000
Sesameseed Cake	0.0002	0.0000			0.0001			
Sorghum and products	0.0000	0.0001	0.0002	0.0000	0.0000	0.0003	0.0000	0.0000
Soyabean Cake	0.0809	0.0084	0.0768	0.0560	0.0613	0.0100	0.0045	0.0059
Soyabeans		0.0005	0.0016			0.0001		0.0003
Sugar & Sweeteners	0.0009							
Sugar beet			0.0050		0.0006		0.0078	
Sugar cane								0.0000
Sunflower seed				0.0030	0.0012	0.0002		0.0002
Sunflowerseed Cake	0.0197	0.0013	0.0273	0.0158	0.0377	0.0012	0.0002	0.0009
Sweet potatoes		0.0019			0.0001	0.0000		0.0010
Tomatoes and products						0.0017		
Vegetables, Other	0.0019	0.0017	0.0245	0.0002	0.0002	0.0032	0.0009	0.0015
Wheat and products	0.0192	0.0017	0.0076	0.0334	0.0098	0.0023	0.0035	0.0061

Goat										
Country	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czech Republic	Denmark	Estonia	Finland	France
Apples and products		0.0003								
Barley and products	0.1192	0.0570	0.1766	0.0646	0.4549	0.2039	0.1997	0.7477	0.3077	0.0970
Beans			0.0096	0.0205		0.0073		0.0030		
Brans	0.0238	0.0557	0.2995	0.0481	0.0390	0.0423	0.0110	0.0809	0.0261	0.0408
Cassava and products	0.0000	0.0129	0.0014			0.0001	0.0000		0.0147	0.0016
Cereals, Other	0.0944	0.0053	0.0274	0.0090	0.0012	0.0454	0.0164	0.0743	0.0055	0.0536
Coconuts - Incl Copra								0.0001		
Copra Cake		0.0008	0.000004		0.000000	0.000004	0.000004		0.000004	0.000029
Cottonseed					0.0003					
Cottonseed Cake	0.0003	0.0001	0.0002					0.0001	0.000004	0.000033
Fruits, Other		0.0006								
Groundnut Cake		0.0001	0.0071			0.0009	0.0001			0.0010
Groundnuts (in Shell Eq)								0.0028		
Groundnuts (Shelled Eq)								0.0020		
Maize and products	0.2357	0.0716	0.4690	0.7016	0.2909	0.1349	0.0071	0.0363	0.0006	0.1579
Millet and products	0.0005	0.0019	0.0036	0.0002	0.0003	0.0002	0.0002	0.0001	0.0000	0.0004
Molasses	0.0501	0.0279	0.1396	0.2088	0.0389	0.2925	0.1674	0.0899		0.0105
Oats	0.0159	0.0063	0.0255	0.0267	0.0004	0.0283	0.0222	0.1797	0.1617	0.0087
Oilcrops Oil, Other									0.0000	
Oilcrops, Other	0.0013	0.0027	0.0029	0.0009	0.0002	0.0101	0.0004	0.0380	0.0002	0.0009
Oilseed Cakes, Other	0.0022	0.0106	0.0182	0.0095	0.0001	0.0013	0.0005	0.0026	0.0000	0.0029
Olive Oil					0.0001					
Palmkernel Cake	0.0006	0.0083		0.000001		0.0001	0.0012	0.0001	0.0007	0.0020
Peas	0.0559	0.0095	0.0040			0.0606	0.0219	0.0477	0.0864	0.0431
Potatoes and products	0.0195	0.0803	0.0634	0.0251	0.1071	0.1335	0.0287	0.2617	0.0145	0.0460
Pulses, Other and products	0.0344	0.0004	0.0157	0.0119	0.0016	0.0623	0.0073	0.0009	0.0013	0.0164
Rape and Mustard Cake	0.0374	0.0157	0.0050	0.0131	0.0018	0.1407	0.0254	0.2678	0.1094	0.0497
Rape and Mustardseed	0.0001	0.0206				0.0186	0.0104	0.0590		0.0049
Rice (Milled Equivalent)		0.0043	0.0043		0.0002	0.0007	0.0002			0.0023
Rice (Paddy Equivalent)		0.0064	0.0064		0.0003	0.0010	0.0003			0.0034
Roots, Other		0.0005	0.0000		0.0108		0.0002	0.0117	0.0002	0.0007
Rye and products	0.0148	0.0017	0.0053	0.0014		0.0010	0.0068	0.0101	0.0001	0.0022
Sesame seed								0.0005		
Sesameseed Cake		0.00005			0.00002	0.0003	0.0001			0.0001
Sorghum and products	0.000003	0.0085	0.0058	0.0005	0.0061	0.0000	0.0032			0.0075
Soyabean Cake	0.1053	0.0528	0.1724	0.2117	0.1796	0.2946	0.1194	0.0929	0.0622	0.0879
Soyabean Oil	0.0004	0.0015								
Soyabeans	0.0182	0.0162		0.0049	0.0008		0.0017	0.0037		0.0037
Sugar & Sweeteners	0.0053		0.0037				0.0012	0.0056	0.0064	0.0081
Sugar beet			0.0006	0.0132				0.0021		
Sugar cane						0.00004				
Sunflower seed	0.0030		0.1393	0.0005		0.0021	0.0015	0.0047		0.0050
Sunflowerseed Cake	0.0075	0.0063	0.1627	0.0384	0.0575	0.0144	0.0161	0.0186	0.0041	0.0186
Sweet potatoes		0.0001								0.0011
Sweeteners, Other										0.0047
Vegetable Oils		0.0015								
Vegetables, Other	0.0001	0.0186	0.2449	0.0549	0.0493	0.0047	0.0001		0.0139	0.0143
Wheat and products	0.0847	0.1068	0.6694	0.0780	0.0078	0.4203	0.3219	0.5134	0.0872	0.2151

Goat										
Country	Germany	Greece	Hungary	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands
Apples and products		0.0050	0.0037				0.0029	0.0472		
Barley and products	0.1633	0.0649	0.1756	0.2700	0.0458	0.1856	0.3161	0.0770	0.1086	0.0420
Beans	0.0011	0.0006		0.0199		0.0080	0.0092			0.0022
Brans	0.0330	0.0551	0.0655	0.0469	0.1147	0.0724	0.0460	0.0105	0.0331	0.0226
Cassava and products	0.0079	0.0009		0.0002	0.0054		0.0025	0.0010	0.0026	0.0215
Cereals, Other	0.0436	0.0035	0.1035	0.0021	0.0018	0.0538	0.1805	0.0590	0.0033	0.0055
Coconuts - Incl Copra							0.0001			
Copra Cake	0.0000	0.0000		0.0000	0.0000	0.0000		0.0001		0.0004
Cottonseed					0.0001					
Cottonseed Cake	0.0000	0.0180	0.0005	0.0003	0.0027				0.0030	0.0000
Fruits, Other		0.0030						0.0031		
Groundnut Cake	0.0001	0.0009		0.0000	0.0002	0.0000				0.0019
Maize and products	0.0853	0.3457	0.8648	0.0534	0.3477	0.0164	0.0525	0.0140	0.1646	0.0916
Millet and products	0.0002	0.0000	0.0045	0.0000	0.0003	0.0001	0.0000	0.0000	0.0002	0.0004
Molasses	0.0580	0.0185	0.0229		0.0109	0.0103	0.0027		0.0155	0.0157
Oats	0.0135	0.0206	0.0375	0.0252	0.0103	0.1144	0.0629	0.0039	0.0012	0.0020
Oilcrops, Other	0.0003	0.0012	0.0030	0.0099	0.0000	0.0117	0.0184	0.0015	0.0008	
Oilseed Cakes, Other	0.0011	0.0022	0.0078	0.0009	0.0039	0.0033	0.0013	0.0056	0.0009	0.0006
Onions			0.0062							
Palm kernels						0.0000				
Palmkernel Cake	0.0071		0.0001	0.0258	0.0001		0.0007	0.0088		0.0271
Peas	0.0320	0.0007	0.0172	0.0061	0.0083	0.0078	0.0173	0.0234		0.0081
Potatoes and products	0.0364	0.0478	0.0601	0.0114	0.0085	0.3075	0.2621	0.0582		0.0683
Pulses, Other and products	0.0171	0.0090	0.0008		0.0106	0.0003	0.0429	0.0065	0.0961	0.0005
Rape and Mustard Cake	0.0502	0.0027	0.0087	0.0401	0.0046	0.0977	0.0003	0.0626		0.0338
Rape and Mustard Oil	0.0143									
Rape and Mustardseed	0.0015	0.0006				0.0809	0.1367	0.0051	0.0001	0.0084
Rice (Milled Equivalent)	0.0006	0.0013	0.0019		0.0008	0.0001	0.0002	0.0007		0.0020
Rice (Paddy Equivalent)	0.0009	0.0020	0.0029		0.0012	0.0002	0.0003	0.0011		0.0030
Roots, Other	0.0001	0.0001	0.0002	0.0018	0.0015			0.0014		0.0006
Rye and products	0.0368	0.0054	0.0190		0.0006	0.0522	0.0335	0.0035	0.0000	0.0029
Sesame seed							0.0003			
Sesameseed Cake	0.0002	0.0013			0.0001			0.0002		0.0001
Sesameseed Oil						0.0000				
Sorghum and products	0.0013	0.0002	0.0018	0.0023	0.0121	0.00001	0.0001	0.00002	0.0001	0.0030
Soyabean Cake	0.0833	0.1240	0.2933	0.0744	0.1325	0.1134	0.1503	0.0815	0.1587	0.0827
Soyabean Oil					0.0012			0.0004		
Soyabeans		0.0007	0.0087	0.0049	0.0028	0.0126	0.0015	0.0015	0.0003	0.0000
Sugar & Sweeteners	0.0004		0.0031				0.0150			
Sugar beet	0.0001				0.0034	0.0252	0.0013			
Sugar cane				0.0014						0.0000
Sunflower seed	0.0016		0.0139		0.0018	0.0012	0.0012			
Sunflowerseed Cake	0.0027	0.0251	0.1504	0.0201	0.0254	0.0344	0.0391	0.0009	0.0118	0.0131
Sweet potatoes	0.0004	0.0001		0.0025	0.0002					
Sweeteners, Other							0.0150			
Vegetable Oils								0.0004		
Vegetables, Other	0.0174	0.0698	0.2954	0.1023	0.1018	0.0001	0.0347	0.0002	0.0404	0.0282
Wheat and products	0.2102	0.0903	0.3440	0.1890	0.0535	0.3105	0.1778	0.1305		0.1322

Country	Goat							
	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	United Kingdom
Apples and products			0.0253			0.0025		
Bananas		0.0059						
Barley and products	0.0735	0.0237	0.0302	0.0766	0.0758	0.1033	0.0926	0.0887
Beans		0.0065	0.0005	0.0247	0.0024	0.0000		0.0133
Brans	0.0276	0.0217	0.0807	0.0993	0.0396	0.0161	0.0171	0.0339
Cassava and products	0.0000	0.0319	0.0000	0.0002	0.0000	0.0243	0.0001	0.0042
Cereals, Other	0.2000	0.0039	0.0104	0.0182	0.0225	0.0026	0.0300	0.0020
Copra Cake	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cottonseed				0.0023		0.0012		
Cottonseed Cake	0.0000	0.0010	0.0000		0.0000	0.0009		0.0000
Fruits, Other			0.0290			0.0036		
Groundnut Cake	0.0010	0.0005	0.0002	0.0004		0.0000		0.0000
Maize and products	0.0589	0.1987	0.6589	0.3513	0.2918	0.0877	0.0022	0.0006
Millet and products	0.0004	0.0003	0.0004	0.0005	0.0005	0.0001	0.0000	0.0004
Molasses	0.0079	0.0130	0.0111	0.0509	0.0165	0.0150	0.0213	0.0368
Oats	0.0310	0.0059	0.0257	0.0125	0.0065	0.0120	0.0564	0.0059
Oilcrops Oil, Other					0.0036			
Oilcrops, Other	0.0004	0.0009	0.0022	0.0058	0.0005	0.0013	0.0221	0.0008
Oilseed Cakes, Other	0.0032	0.0029	0.0008	0.0029	0.0032	0.0009	0.0017	0.0031
Palmkernel Cake	0.0023	0.0110	0.0002	0.0001		0.0022	0.0116	0.0180
Peas			0.0113	0.2596		0.0241	0.0106	
Potatoes and products	0.2006	0.0338	0.2397	0.0335	0.1052	0.0196	0.0439	0.0022
Pulses, Other and products	0.0190	0.0206	0.0000	0.0688	0.0032	0.0149	0.0003	0.0814
Rape and Mustard Cake	0.0620	0.0176	0.0318	0.1213	0.0507	0.0112	0.0481	0.0343
Rape and Mustardseed			0.0020	0.0126			0.0047	0.0081
Rice (Milled Equivalent)	0.0002			0.0035	0.0003	0.0000	0.0000	0.0004
Rice (Paddy Equivalent)	0.0003			0.0052	0.0005	0.0000	0.0001	0.0005
Roots, Other				0.0002	0.0904	0.0016	0.0004	0.0038
Rye and products	0.0228	0.0001	0.0002	0.0003	0.0006	0.0042	0.0028	0.0005
Sesameseed Cake	0.0005	0.0000			0.0002			
Sesameseed Oil								
Sorghum and products	0.0002	0.0024	0.0016	0.0000	0.0001	0.0086	0.0000	0.0007
Soyabean Cake	0.1840	0.1116	0.3311	0.2396	0.1311	0.1317	0.0593	0.0786
Soyabean Oil								
Soyabeans		0.0069	0.0071			0.0018		0.0042
Sugar & Sweeteners	0.0013							
Sugar beet			0.0143		0.0009		0.0687	
Sugar cane								0.0000
Sunflower seed				0.0130	0.0026	0.0028		0.0020
Sunflowerseed Cake	0.0448	0.0166	0.1176	0.0676	0.0805	0.0155	0.0023	0.0124
Sweet potatoes		0.0165			0.0001	0.0002		0.0085
Tomatoes and products						0.0148		
Vegetables, Other	0.0028	0.0153	0.0706	0.0005	0.0002	0.0284	0.0081	0.0131
Wheat and products	0.0970	0.0485	0.0728	0.3173	0.0467	0.0679	0.1019	0.1780

Dairy										
Country	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czech Republic	Denmark	Estonia	Finland	France
Apples and products		0.0001								
Barley and products	0.0583	0.0279	0.0407	0.0271	0.1636	0.0464	0.0977	0.1775	0.1505	0.0474
Beans			0.0019	0.0073		0.0014		0.0006		
Brans	0.0116	0.0272	0.0690	0.0202	0.0140	0.0096	0.0054	0.0192	0.0127	0.0200
Cassava and products	0.0000	0.0051	0.0003			0.0000	0.0000		0.0058	0.0006
Cereals, Other	0.0462	0.0026	0.0063	0.0038	0.0004	0.0103	0.0080	0.0176	0.0027	0.0262
Coconuts - Incl Copra								0.0000		
Copra Cake		0.0004	0.0000		0.0000	0.0000	0.0000		0.0000	0.0000
Cottonseed					0.0001					
Cottonseed Cake	0.0001	0.0000	0.0000					0.0000	0.0000	0.0000
Fruits, Other		0.0002								
Groundnut Cake		0.0000	0.0016			0.0002	0.0001			0.0005
Groundnuts (in Shell Eq)								0.0007		
Groundnuts (Shelled Eq)								0.0005		
Maize and products	0.1153	0.0350	0.1080	0.2941	0.1046	0.0307	0.0035	0.0086	0.0003	0.0772
Millet and products	0.0002	0.0009	0.0008	0.0001	0.0001	0.0000	0.0001	0.0000	0.0000	0.0002
Molasses	0.0198	0.0110	0.0273	0.0742	0.0113	0.0564	0.0660	0.0181		0.0042
Oats	0.0078	0.0031	0.0059	0.0112	0.0002	0.0064	0.0109	0.0427	0.0791	0.0043
Oilcrops Oil, Other									0.0000	
Oilcrops, Other	0.0006	0.0013	0.0007	0.0004	0.0001	0.0023	0.0002	0.0090	0.0001	0.0004
Oilseed Cakes, Other	0.0011	0.0052	0.0042	0.0040	0.0000	0.0003	0.0002	0.0006	0.0000	0.0014
Olive Oil					0.0000					
Palmkernel Cake	0.0003	0.0040		0.0000		0.0000	0.0006	0.0000	0.0003	0.0010
Peas	0.0221	0.0038	0.0008			0.0117	0.0086	0.0096	0.0341	0.0170
Potatoes and products	0.0077	0.0317	0.0124	0.0089	0.0311	0.0258	0.0113	0.0527	0.0057	0.0181
Pulses, Other and products	0.0136	0.0001	0.0031	0.0042	0.0005	0.0120	0.0029	0.0002	0.0005	0.0065
Rape and Mustard Cake	0.0183	0.0077	0.0012	0.0055	0.0006	0.0320	0.0124	0.0636	0.0535	0.0243
Rape and Mustardseed	0.0000	0.0101				0.0042	0.0051	0.0140		0.0024
Rice (Milled Equivalent)		0.0021	0.0010		0.0001	0.0002	0.0001			0.0011
Rice (Paddy Equivalent)		0.0031	0.0015		0.0001	0.0002	0.0001			0.0017
Roots, Other		0.0002	0.0000		0.0031		0.0001	0.0023	0.0001	0.0003
Rye and products	0.0072	0.0008	0.0012	0.0006		0.0002	0.0033	0.0024	0.0000	0.0011
Sesame seed								0.0001		
Sesameseed Cake	0.0000	0.0000			0.0000	0.0001	0.0000			0.0000
Sorghum and products	0.0000	0.0042	0.0013	0.0002	0.0022	0.0000	0.0016			0.0037
Soyabean Cake	0.0515	0.0258	0.0397	0.0887	0.0646	0.0671	0.0584	0.0220	0.0304	0.0430
Soyabean Oil	0.0002	0.0007								
Soyabeans	0.0089	0.0079		0.0021	0.0003		0.0008	0.0009		0.0018
Sugar & Sweeteners	0.0021		0.0007				0.0005	0.0011	0.0025	0.0032
Sugar beet			0.0001	0.0047				0.0004		
Sugar cane						0.0000				
Sunflower seed	0.0015		0.0321	0.0002		0.0005	0.0007	0.0011		0.0024
Sunflowerseed Cake	0.0037	0.0031	0.0375	0.0161	0.0207	0.0033	0.0079	0.0044	0.0020	0.0091
Sweet potatoes		0.0000								0.0004
Sweeteners, Other										0.0018
Vegetable Oils		0.0007								
Vegetables, Other	0.0000	0.0074	0.0478	0.0195	0.0143	0.0009	0.0000		0.0055	0.0057
Wheat and products	0.0414	0.0522	0.1542	0.0327	0.0028	0.0957	0.1574	0.1218	0.0426	0.1052

Dairy										
Country	Germany	Greece	Hungary	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands

Apples and products		0.0020	0.0008				0.0006	0.0186		
Barley and products	0.0799	0.0317	0.0422	0.1320	0.0224	0.0470	0.0728	0.0376	0.0531	0.0206
Beans	0.0004	0.0003		0.0078		0.0017	0.0018			0.0009
Brans	0.0162	0.0269	0.0158	0.0229	0.0561	0.0184	0.0106	0.0051	0.0162	0.0110
Cassava and products	0.0031	0.0003		0.0001	0.0021		0.0005	0.0004	0.0010	0.0085
Cereals, Other	0.0213	0.0017	0.0249	0.0010	0.0009	0.0136	0.0416	0.0289	0.0016	0.0027
Copra Cake	0.0000	0.0000		0.0000	0.00002	0.0000		0.00002		0.0002
Cottonseed					0.00003					
Cottonseed Cake	0.0000	0.0088	0.0001	0.0001	0.0013				0.0015	0.0000
Fruits, Other		0.0012						0.0012		
Groundnut Cake	0.0000	0.0005		0.0000	0.0001	0.0000				0.0009
Maize and products	0.0417	0.1690	0.2080	0.0261	0.1701	0.0042	0.0121	0.0068	0.0805	0.0448
Millet and products	0.0001	0.0000	0.0011	0.0000	0.0002	0.0000	0.0000	0.0000	0.0001	0.0002
Molasses	0.0229	0.0073	0.0047		0.0043	0.0022	0.0005		0.0061	0.0062
Oats	0.0066	0.0101	0.0090	0.0123	0.0050	0.0290	0.0145	0.0019	0.0006	0.0010
Oilcrops Oil, Other										
Oilcrops, Other	0.0002	0.0006	0.0007	0.0049	0.0000	0.0030	0.0042	0.0007	0.0004	
Oilseed Cakes, Other	0.0005	0.0011	0.0019	0.0005	0.0019	0.0008	0.0003	0.0027	0.0004	0.0003
Onions			0.0013							
Palm kernels						0.0000				
Palmkernel Cake	0.0035		0.0000	0.0126	0.0001		0.0002	0.0043		0.0133
Peas	0.0126	0.0003	0.0035	0.0024	0.0033	0.0017	0.0034	0.0092		0.0032
Potatoes and products	0.0144	0.0189	0.0123	0.0045	0.0034	0.0660	0.0512	0.0230		0.0269
Pulses, Other and products	0.0067	0.0036	0.0002		0.0042	0.0001	0.0084	0.0026	0.0379	0.0002
Rape and Mustard Cake	0.0246	0.0013	0.0021	0.0196	0.0023	0.0247	0.0001	0.0306		0.0165
Rape and Mustard Oil	0.0070									
Rape and Mustardseed	0.0007	0.0003				0.0205	0.0315	0.0025	0.0000	0.0041
Rice (Milled Equivalent)	0.0003	0.0006	0.0005		0.0004	0.0000	0.0000	0.0004		0.0010
Rice (Paddy Equivalent)	0.0004	0.0010	0.0007		0.0006	0.0000	0.0001	0.0005		0.0015
Roots, Other	0.0001	0.0000	0.0000	0.0007	0.0006			0.0006		0.0002
Rye and products	0.0180	0.0026	0.0046		0.0003	0.0132	0.0077	0.0017	0.0000	0.0014
Sesame seed							0.0001			
Sesameseed Cake	0.0001	0.0006			0.0001			0.0001		0.0000
Sesameseed Oil						0.0000				
Sorghum and products	0.0007	0.0001	0.0004	0.0011	0.0059	0.0000	0.0000	0.0000	0.0000	0.0015
Soyabean Cake	0.0407	0.0607	0.0705	0.0364	0.0648	0.0287	0.0346	0.0399	0.0776	0.0405
Soyabean Oil					0.0006			0.0002		
Soyabeans		0.0004	0.0021	0.0024	0.0013	0.0032	0.0004	0.0007	0.0001	0.0000
Sugar & Sweeteners	0.0002		0.0006				0.0029			
Sugar beet	0.0000				0.0014	0.0054	0.0003			
Sugar cane				0.0005						0.0000
Sunflower seed	0.0008		0.0033		0.0009	0.0003	0.0003			
Sunflowerseed Cake	0.0013	0.0123	0.0362	0.0098	0.0124	0.0087	0.0090	0.0005	0.0058	0.0064
Sweet potatoes	0.0001	0.0001		0.0010	0.0001					
Sweeteners, Other							0.0029			
Vegetable Oils								0.0002		
Vegetables, Other	0.0069	0.0275	0.0602	0.0404	0.0402	0.0000	0.0068	0.0001	0.0159	0.0111
Wheat and products	0.1028	0.0442	0.0827	0.0924	0.0262	0.0786	0.0409	0.0638		0.0647

Dairy								
Country	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	United Kingdom
Apples and products			0.0050			0.0010		
Bananas		0.0023						
Barley and products	0.0288	0.0116	0.0070	0.0179	0.0318	0.0505	0.0453	0.0434
Beans		0.0026	0.0001	0.0049	0.0009	0.0000		0.0052
Brans	0.0108	0.0106	0.0187	0.0233	0.0166	0.0079	0.0084	0.0166
Cassava and products	0.0000	0.0126	0.0000	0.0000	0.0000	0.0096	0.0000	0.0017
Cereals, Other	0.0783	0.0019	0.0024	0.0043	0.0094	0.0013	0.0147	0.0010
Copra Cake	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cottonseed				0.0005		0.0006		
Cottonseed Cake	0.0000	0.0005	0.0000		0.0000	0.0004		0.0000
Fruits, Other			0.0057			0.0014		
Groundnut Cake	0.0004	0.0002	0.0000	0.0001		0.0000		0.0000
Maize and products	0.0231	0.0972	0.1528	0.0823	0.1223	0.0429	0.0011	0.0003
Millet and products	0.0001	0.0002	0.0001	0.0001	0.0002	0.0000	0.0000	0.0002
Molasses	0.0026	0.0051	0.0022	0.0101	0.0059	0.0059	0.0084	0.0145
Oats	0.0121	0.0029	0.0060	0.0029	0.0027	0.0059	0.0276	0.0029
Oilcrops Oil, Other					0.0015			
Oilcrops, Other	0.0002	0.0004	0.0005	0.0014	0.0002	0.0006	0.0108	0.0004
Oilseed Cakes, Other	0.0012	0.0014	0.0002	0.0007	0.0014	0.0004	0.0008	0.0015
Palmkernel Cake	0.0009	0.0054	0.0000	0.0000		0.0011	0.0057	0.0088
Peas			0.0022	0.0515		0.0095	0.0042	
Potatoes and products	0.0666	0.0133	0.0471	0.0066	0.0374	0.0077	0.0173	0.0009
Pulses, Other and products	0.0063	0.0081	0.0000	0.0137	0.0012	0.0059	0.0001	0.0321
Rape and Mustard Cake	0.0243	0.0086	0.0074	0.0284	0.0213	0.0055	0.0235	0.0168
Rape and Mustardseed			0.0004	0.0030			0.0023	0.0040
Rice (Milled Equivalent)	0.0001			0.0008	0.0001	0.0000	0.0000	0.0002
Rice (Paddy Equivalent)	0.0001			0.0012	0.0002	0.0000	0.0000	0.0003
Roots, Other				0.0000	0.0321	0.0006	0.0002	0.0015
Rye and products	0.0089	0.0001	0.0000	0.0001	0.0003	0.0020	0.0013	0.0002
Sesameseed Cake	0.0002	0.0000			0.0001			
Sorghum and products	0.0001	0.0012	0.0004	0.0000	0.0000	0.0042	0.0000	0.0004
Soyabean Cake	0.0720	0.0546	0.0768	0.0561	0.0550	0.0644	0.0290	0.0385
Soyabeans		0.0034	0.0017			0.0009		0.0020
Sugar & Sweeteners	0.0004							
Sugar beet			0.0028		0.0003		0.0271	
Sugar cane								0.0000
Sunflower seed				0.0030	0.0011	0.0014		0.0010
Sunflowerseed Cake	0.0175	0.0081	0.0273	0.0158	0.0338	0.0076	0.0011	0.0061
Sweet potatoes		0.0065			0.0000	0.0001		0.0034
Tomatoes and products						0.0058		
Vegetables, Other	0.0009	0.0060	0.0139	0.0001	0.0001	0.0112	0.0032	0.0052
Wheat and products	0.0379	0.0237	0.0169	0.0743	0.0196	0.0332	0.0498	0.0871

Laying Hens										
Country	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czech Republic	Denmark	Estonia	Finland	France
Apples and products		0.0003								
Barley and products	0.2852	0.1340	0.2092	0.1321	0.8585	0.2388	0.5251	0.9130	0.7217	0.2462
Beans			0.0042	0.0154		0.0031		0.0014		
Brans	0.0569	0.1310	0.3549	0.0983	0.0735	0.0496	0.0288	0.0988	0.0611	0.1036
Cassava and products	0.0000	0.0112	0.0006			0.0001	0.0000		0.0127	0.0015
Cereals, Other	0.2260	0.0124	0.0325	0.0183	0.0022	0.0532	0.0431	0.0907	0.0130	0.1360
Coconuts - Incl Copra								0.0001		
Copra Cake		0.0012	0.0000		0.0000	0.0000	0.0000		0.0000	0.0000
Cottonseed					0.0003					
Cottonseed Cake	0.0004	0.0001	0.0002					0.0001	0.0000	0.0001
Fruits, Other		0.0005								
Groundnut Cake		0.0002	0.0056			0.0007	0.0002			0.0017
Groundnuts (in Shell Eq)								0.0023		
Groundnuts (Shelled Eq)								0.0016		
Maize and products	0.5641	0.1685	0.5556	1.4338	0.5489	0.1579	0.0186	0.0444	0.0015	0.4007
Millet and products	0.0012	0.0045	0.0042	0.0004	0.0006	0.0002	0.0006	0.0001	0.0000	0.0010
Molasses	0.0443	0.0243	0.0611	0.1576	0.0271	0.1265	0.1625	0.0405		0.0099
Oats	0.0380	0.0148	0.0302	0.0545	0.0008	0.0331	0.0584	0.2195	0.3792	0.0221
Oilcrops Oil, Other									0.0000	
Oilcrops, Other	0.0021	0.0042	0.0023	0.0012	0.0002	0.0079	0.0007	0.0309	0.0003	0.0014
Oilseed Cakes, Other	0.0035	0.0166	0.0144	0.0129	0.0001	0.0010	0.0008	0.0021	0.0000	0.0049
Olive Oil					0.0001					
Palmkernel Cake	0.0009	0.0130		0.0000		0.0001	0.0020	0.0000	0.0011	0.0034
Peas	0.0494	0.0083	0.0018			0.0262	0.0212	0.0215	0.0748	0.0404
Potatoes and products	0.0172	0.0697	0.0277	0.0190	0.0746	0.0577	0.0279	0.1180	0.0126	0.0431
Pulses, Other and products	0.0304	0.0003	0.0069	0.0090	0.0011	0.0269	0.0071	0.0004	0.0011	0.0153
Rape and Mustard Cake	0.0597	0.0246	0.0040	0.0179	0.0022	0.1098	0.0446	0.2180	0.1711	0.0841
Rape and Mustardseed	0.0002	0.0323				0.0145	0.0182	0.0480		0.0083
Rice (Milled Equivalent)		0.0101	0.0051		0.0003	0.0008	0.0005			0.0058
Rice (Paddy Equivalent)		0.0151	0.0076		0.0005	0.0012	0.0007			0.0087
Roots, Other		0.0004	0.0000		0.0075		0.0002	0.0053	0.0002	0.0007
Rye and products	0.0354	0.0040	0.0063	0.0029		0.0011	0.0178	0.0123	0.0003	0.0056
Sesame seed								0.0004		
Sesameseed Cake		0.0001			0.0000	0.0002	0.0001			0.0002
Sorghum and products	0.0000	0.0200	0.0069	0.0010	0.0115	0.0000	0.0084			0.0191
Soyabean Cake	0.1680	0.0827	0.1361	0.2884	0.2259	0.2300	0.2094	0.0756	0.0972	0.1487
Soyabean Oil	0.0007	0.0023								
Soyabeans	0.0291	0.0255		0.0067	0.0010		0.0029	0.0030		0.0063
Sugar & Sweeteners	0.0047		0.0016				0.0012	0.0025	0.0056	0.0076
Sugar beet			0.0002	0.0100				0.0010		
Sugar cane						0.0000				
Sunflower seed	0.0048		0.1100	0.0007		0.0016	0.0026	0.0038		0.0084
Sunflowerseed Cake	0.0119	0.0098	0.1285	0.0523	0.0723	0.0112	0.0282	0.0152	0.0065	0.0314
Sweet potatoes		0.0000								0.0010
Sweeteners, Other										0.0044
Vegetable Oils		0.0023								
Vegetables, Other	0.0001	0.0162	0.1071	0.0414	0.0344	0.0020	0.0001		0.0120	0.0134
Wheat and products	0.2027	0.2513	0.7931	0.1594	0.0147	0.4922	0.8463	0.6268	0.2045	0.5459

Laying Hens										
Country	Germany	Greece	Hungary	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands
Apples and products		0.0051	0.0017				0.0013	0.0410		
Barley and products	0.4193	0.1787	0.2173	0.6301	0.1030	0.2419	0.3743	0.1811	0.3111	0.0979
Beans	0.0011	0.0007		0.0171		0.0038	0.0040			0.0019
Brans	0.0848	0.1518	0.0811	0.1095	0.2579	0.0944	0.0544	0.0247	0.0949	0.0526
Cassava and products	0.0075	0.0009		0.0002	0.0045		0.0011	0.0009	0.0027	0.0185
Cereals, Other	0.1120	0.0095	0.1281	0.0049	0.0040	0.0701	0.2138	0.1388	0.0095	0.0129
Coconuts - Incl Copra							0.0001			
Copra Cake	0.0000	0.0000		0.0001	0.0001	0.0000		0.0001		0.0006
Cottonseed					0.0001					
Cottonseed Cake	0.0000	0.0330	0.0004	0.0004	0.0040				0.0057	0.0000
Fruits, Other		0.0030						0.0027		
Groundnut Cake	0.0001	0.0017		0.0000	0.0003	0.0000				0.0029
Maize and products	0.2190	0.9522	1.0699	0.1245	0.7817	0.0214	0.0621	0.0329	0.4716	0.2136
Millet and products	0.0005	0.0001	0.0056	0.0001	0.0007	0.0002	0.0001	0.0000	0.0005	0.0009
Molasses	0.0550	0.0189	0.0105		0.0090	0.0050	0.0012		0.0164	0.0135
Oats	0.0347	0.0567	0.0463	0.0589	0.0231	0.1490	0.0744	0.0091	0.0034	0.0047
Oilcrops, Other	0.0006	0.0022	0.0025	0.0155	0.0000	0.0102	0.0145	0.0024	0.0015	
Oilseed Cakes, Other	0.0018	0.0040	0.0064	0.0014	0.0058	0.0029	0.0010	0.0087	0.0017	0.0010
Onions			0.0028							
Palm kernels						0.0000				
Palmkernel Cake	0.0122		0.0001	0.0401	0.0002		0.0006	0.0138		0.0421
Peas	0.0303	0.0007	0.0078	0.0053	0.0069	0.0038	0.0076	0.0203		0.0070
Potatoes and products	0.0345	0.0486	0.0275	0.0098	0.0071	0.1479	0.1146	0.0506		0.0587
Pulses, Other and products	0.0162	0.0092	0.0004		0.0088	0.0001	0.0188	0.0057	0.1017	0.0004
Rape and Mustard Cake	0.0859	0.0050	0.0071	0.0624	0.0069	0.0849	0.0002	0.0982		0.0525
Rape and Mustard Oil	0.0244									
Rape and Mustardseed	0.0026	0.0010				0.0702	0.1079	0.0080	0.0001	0.0131
Rice (Milled Equivalent)	0.0015	0.0036	0.0024		0.0018	0.0002	0.0002	0.0017		0.0047
Rice (Paddy Equivalent)	0.0023	0.0055	0.0036		0.0027	0.0002	0.0004	0.0026		0.0071
Roots, Other	0.0001	0.0001	0.0001	0.0016	0.0012			0.0012		0.0005
Rye and products	0.0944	0.0149	0.0235		0.0014	0.0680	0.0397	0.0082	0.0001	0.0067
Sesame seed							0.0003			
Sesameseed Cake	0.0004	0.0024			0.0002			0.0003		0.0001
Sesameseed Oil						0.0000				
Sorghum and products	0.0034	0.0004	0.0022	0.0053	0.0273	0.0000	0.0001	0.0001	0.0002	0.0070
Soyabean Cake	0.1426	0.2278	0.2419	0.1158	0.1986	0.0985	0.1186	0.1279	0.3032	0.1285
Soyabean Oil					0.0018			0.0006		
Soyabeans		0.0013	0.0072	0.0077	0.0041	0.0110	0.0012	0.0023	0.0006	0.0001
Sugar & Sweeteners	0.0004		0.0014				0.0065			
Sugar beet	0.0001				0.0029	0.0121	0.0006			
Sugar cane				0.0012						0.0000
Sunflower seed	0.0027		0.0114		0.0028	0.0011	0.0009			
Sunflowerseed Cake	0.0047	0.0460	0.1241	0.0313	0.0381	0.0299	0.0308	0.0015	0.0225	0.0204
Sweet potatoes	0.0003	0.0001		0.0021	0.0002					
Sweeteners, Other							0.0065			
Vegetable Oils								0.0006		
Vegetables, Other	0.0165	0.0710	0.1349	0.0881	0.0845	0.0000	0.0152	0.0002	0.0428	0.0243
Wheat and products	0.5397	0.2488	0.4255	0.4410	0.1203	0.4046	0.2106	0.3071		0.3081

Laying Hens								
Country	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	United Kingdom
Apples and products			0.0111			0.0023		
Bananas		0.0061						
Barley and products	0.1480	0.0665	0.0360	0.0923	0.1634	0.2642	0.2583	0.2179
Beans		0.0067	0.0002	0.0110	0.0019	0.0000		0.0120
Brans	0.0555	0.0609	0.0963	0.1196	0.0854	0.0411	0.0478	0.0833
Cassava and products	0.0000	0.0330	0.0000	0.0001	0.0000	0.0230	0.0001	0.0038
Cereals, Other	0.4027	0.0109	0.0124	0.0219	0.0484	0.0067	0.0837	0.0050
Copra Cake	0.0000	0.0001	0.0000	0.0000	0.0000	0.0001	0.0000	0.0000
Cottonseed				0.0019		0.0020		
Cottonseed Cake	0.0000	0.0018	0.0000		0.0000	0.0015		0.0000
Fruits, Other			0.0128			0.0034		
Groundnut Cake	0.0014	0.0009	0.0002	0.0003		0.0000		0.0000
Maize and products	0.1187	0.5578	0.7861	0.4232	0.6287	0.2242	0.0060	0.0014
Millet and products	0.0007	0.0009	0.0004	0.0006	0.0010	0.0003	0.0001	0.0010
Molasses	0.0059	0.0135	0.0049	0.0226	0.0131	0.0142	0.0219	0.0334
Oats	0.0624	0.0166	0.0307	0.0150	0.0140	0.0306	0.1572	0.0145
Oilcrops Oil, Other					0.0051			
Oilcrops, Other	0.0006	0.0016	0.0017	0.0047	0.0007	0.0022	0.0411	0.0014
Oilseed Cakes, Other	0.0043	0.0055	0.0007	0.0023	0.0046	0.0015	0.0032	0.0050
Palmkernel Cake	0.0032	0.0205	0.0002	0.0001		0.0038	0.0216	0.0295
Peas			0.0050	0.1154		0.0227	0.0109	
Potatoes and products	0.1491	0.0351	0.1056	0.0149	0.0836	0.0185	0.0452	0.0020
Pulses, Other and products	0.0141	0.0213	0.0000	0.0306	0.0026	0.0141	0.0003	0.0738
Rape and Mustard Cake	0.0832	0.0330	0.0253	0.0974	0.0728	0.0191	0.0895	0.0562
Rape and Mustardseed			0.0016	0.0101			0.0087	0.0133
Rice (Milled Equivalent)	0.0005			0.0042	0.0007	0.0000	0.0001	0.0009
Rice (Paddy Equivalent)	0.0007			0.0063	0.0011	0.0001	0.0001	0.0013
Roots, Other				0.0001	0.0719	0.0015	0.0005	0.0034
Rye and products	0.0460	0.0004	0.0003	0.0003	0.0014	0.0107	0.0077	0.0012
Sesameseed Cake	0.0007	0.0000			0.0002			
Sorghum and products	0.0005	0.0068	0.0019	0.0000	0.0003	0.0221	0.0000	0.0018
Soyabean Cake	0.2470	0.2089	0.2633	0.1924	0.1883	0.2246	0.1103	0.1288
Soyabeans		0.0128	0.0057			0.0031		0.0068
Sugar & Sweeteners	0.0010							
Sugar beet			0.0063		0.0007		0.0708	
Sugar cane								0.0000
Sunflower seed				0.0104	0.0037	0.0047		0.0033
Sunflowerseed Cake	0.0602	0.0310	0.0935	0.0543	0.1157	0.0265	0.0042	0.0203
Sweet potatoes		0.0171			0.0001	0.0001		0.0077
Tomatoes and products						0.0140		
Vegetables, Other	0.0021	0.0159	0.0311	0.0002	0.0002	0.0268	0.0083	0.0119
Wheat and products	0.1952	0.1362	0.0868	0.3822	0.1006	0.1736	0.2841	0.4373

9.10 Appendix J: Virtual Water import of the EU28 related to import of livestock products (average 2006-13, Mm³/y)

Country	Average Green VWI	Average Blue VWI	Average Grey VWI	Total VWI
Austria	202.9	3.5	3.4	209.8
Belgium	584.8	10.8	10.0	605.6
Bulgaria	226.5	3.4	3.0	232.8
Croatia	165.2	6.9	4.1	176.2
Cyprus	28.5	0.5	0.5	29.5
Czech Rep	103.4	7.6	5.6	116.6
Denmark	184.1	18.1	3.8	206.0
Estonia	23.1	0.4	0.5	23.9
Finland	89.1	1.8	1.4	92.3
France	861.7	27.1	16.9	905.6
Germany	2481.5	88.3	58.6	2628.3
Greece	116.2	1.4	0.7	118.2
Hungary	21.0	0.5	0.4	21.9
Ireland	127.7	4.1	3.0	134.8
Italy	5581.8	80.2	59.4	5721.4
Latvia	0.3	0.0	0.0	0.3
Lithuania	15.4	0.1	0.6	16.2
Luxembourg	5.2	0.3	0.1	5.6
Malta	30.5	0.3	0.2	31.0
Netherlands	1868.8	72.2	37.7	1978.6
Poland	136.0	3.0	5.7	144.7
Portugal	234.7	6.8	3.8	245.2
Romania	247.1	10.5	12.2	269.7
Slovakia	41.4	2.2	1.5	45.0
Slovenia	50.7	1.2	2.4	54.2
Spain	1008.1	30.2	19.2	1057.6
Sweden	223.2	2.5	2.3	228.0
United Kingdom	4194.6	76.3	49.2	4320.2
Grand Total	18853.4	459.9	306.1	19619.4

9.11 Appendix K: Virtual Water import of the EU28 related to import of crop products
(average 2006-13, Mm3/y)

Country	Average Green VWI	Average Blue VWI	Average Grey VWI	Total VWI
Austria	1,243	81	80	1,405
Belgium	14,120	756	460	15,337
Bulgaria	878	78	60	1,016
Croatia	853	25	73	950
Cyprus	372	20	17	409
Czech Rep	629	109	59	797
Denmark	3,598	83	130	3,810
Estonia	1,545	20	21	1,585
Finland	1,118	56	65	1,239
France	22,177	1,009	693	23,880
Germany	42,355	1,667	1,707	45,729
Greece	2,844	130	183	3,157
Hungary	220	23	35	278
Ireland	1,273	72	55	1,400
Italy	24,367	1,089	1,024	26,480
Latvia	171	19	9	199
Lithuania	437	44	42	523
Luxembourg	22	26	4	52
Malta	53	6	5	64
Netherlands	45,093	857	1,144	47,094
Poland	6,396	244	193	6,833
Portugal	5,132	306	229	5,667
Romania	1,763	151	100	2,014
Slovakia	278	20	16	315
Slovenia	793	22	19	834
Spain	25,525	947	1,571	28,043
Sweden	2,037	112	124	2,274
United Kingdom	17,218	1,391	1,001	19,610
Grand Total	222,512	9,362	9,119	240,993

9.12 Appendix L: Virtual Water import of the EU28 related to import of industrial products (average 2006-13, Mm³/y)

Country	Blue VWI (Mm ³ /y)	Grey VWI (Mm ³ /y)	Total VWI (Mm ³ /y)
Austria	77	1,045	1,122
Belgium	159	2,133	2,292
Bulgaria	159	2,955	3,114
Croatia	25	417	442
Cyprus	12	194	206
Czech rep	208	3,591	3,799
Denmark	33	453	487
Estonia	30	514	543
Finland	70	1,096	1,166
France	353	4,599	4,952
Germany	836	11,431	12,267
Greece	84	1,428	1,512
Hungary	199	3,516	3,715
Ireland	33	295	328
Italy	610	10,195	10,805
Latvia	21	373	394
Lithuania	47	852	899
Luxembourg	7	87	94
Malta	5	76	81
Netherlands	293	4,048	4,342
Poland	306	5,349	5,655
Portugal	27	383	410
Romania	134	2,331	2,464
Slovakia	133	2,331	2,465
Slovenia	12	172	184
Spain	220	3,240	3,460
Sweden	57	765	822
UK	324	3,729	4,052
Grand total	4,473	67,599	72,072

9.13 Appendix M: Short summary of studies of Mekonnen and Hoekstra

9.13.1 Water footprint of crop products (Mekonnen and Hoekstra 2010a)

This study provides the water footprint of 126 crops at a 5 by 5 arc minute grid. The period of the study selected is 1996-2005, and presents the results on average over the period of 10 years. The authors have used a dynamic water balance model to calculate crop water use over time, with a time step of one day. The model takes into account the daily soil water balance and climatic conditions for each grid cell. In addition, the water pollution associated with the use of nitrogen fertilizer in crop production is estimated for each grid cell. The crop evapotranspiration of an additional 20 minor crops is calculated with the CROPWAT model. Using the concept of product fraction and value fraction, the water footprint of over 200 derived crop products is also calculated for the spatio-temporal resolution. Monthly long-term average reference evapotranspiration data at a 10 by 10 arc minute resolution were obtained from FAO (2008c). The 10 by 10 arc minute data were converted to a 5 by 5 arc minute resolution by assigning the 10 by 10-minute data to each of the four 5 by 5-minute grid cells. Monthly values for precipitation, number of wet days and minimum and maximum temperature for the period 1996-2002 with a spatial resolution of 30 by 30 arc minute were obtained from CRU-TS-2.1 (Mitchell and Jones, 2005). Crop growing areas on a 5 by 5 arc minute grid cell resolution were obtained from Monfreda *et al.* (2008). Grid data on the irrigated fraction of harvested crop areas for 24 major crops were obtained from the MICRA2000 database, and the rest are derived in the study itself using broad categories of crops in the MICRA2000 database (Portmann *et al.*, 2010). Crop coefficients (Kc's) for crops were obtained from Chapagain and Hoekstra (2004). Grid-based data on total available water capacity of the soil (TAWC) at a 5 by 5 arc minute resolution were taken from ISRIC-WISE (Batjes, 2006). Country-specific nitrogen fertilizer application rates by crop have been estimated based on a variety of sources including FAO (2006, 2009). They have further assumed that on average 10% of the applied nitrogen fertilizer is lost through leaching, following Chapagain *et al.* (2006). The recommended maximum value of nitrate in surface and groundwater concentration is taken as 10 mg/litre of nitrate-nitrogen (NO₃-N), following again Chapagain *et al.* (2006). Because of lack of data, the natural nitrogen concentrations were assumed to be zero. The results are available as 5 by 5 arc minute raster maps and in other formats, downloadable from WaterStat database of WFN.

9.13.2 Water footprint of livestock products (Mekonnen and Hoekstra 2010b)

This study provides the water footprint of 8 animal categories and its derived products: beef cattle, dairy cattle, pig, sheep, goat, broiler chicken, layer chicken and horses. The study distinguishes between different production systems and considers the conditions in all countries of the world separately. It uses the water footprint of feed products from the first study on the water footprint of crop products. It is estimated for three main livestock production systems: grazing, mixed, and industrial. It uses three main factors: feed conversion efficiency of the animal, feed composition, and origin of the feed for each production system separately. The water footprint of animals is distributed to water footprint of livestock products using the concept of product and value fraction following Chapagain & Hoekstra (2003). The main differences with Chapagain and Hoekstra (2003, 2004) are:

- Estimation of the amount of feed consumed per animal category, per production system and per country based on estimates of feed conversion efficiencies and statistics on the annual production of animal products.
- spatial distribution of occurrence of the three production systems (grazing, mixed and industrial) in each country, using the studies of Seré and Steinfeld (1996) and Wint and Robinson (2007).
- Estimation of the green, blue and grey water footprints of the feed crops using a spatially explicit crop water use model able to estimate actual crop water use (Mekonnen and Hoekstra, 2010a).
- distinction between the green and blue water footprint components and inclusion of the grey water footprint component.

This study provides a rich data source for further studies on the factors that determine how animal products put pressure on the global water resources. During the period 1996-2005, the total water footprint for global animal production was 2422 km³/y (87.2% green, 6.2% blue and 6.6% grey water). The results are available to download from WFN's WaterStat database in various formats.

9.13.3 Water footprint of nations (Mekonnen and Hoekstra 2011)

The study is founded on the results of two earlier studies done by the same authors (2010a, 2010b) described above. It follows the method as described in The Water Footprint Assessment Manual, which contains the global standard for water footprint assessment developed by the Water Footprint Network (Hoekstra *et al.*, 2011). As it builds on the study of crop and livestock products, the assessment period is also 1996-2005.

This study is the first to use the bottom-up approach to estimate the water footprint of national consumption of agricultural products on a global scale. The bottom-up approach depends on the quality of consumption data, while the top-down-approach relies on the quality of production and trade data. In the study, the origin of products has been traced by only one step. If a product is imported from another country, we assume that the product has been produced in that country and we take the water footprint of the imported product accordingly. If the trade partner country does not produce that commodity, they do not trace further back but assume a global average water footprint. Tracing of products by more than one step has been done for example by Chapagain and Orr (2008) for the UK but this was too laborious for this global study.

The study analysed a ten-year period, but its results are not presented with annual variations or trends in time. The reason is that though most of the databases used in the study are available for every individual year within the ten-year study period (e.g. production, consumption, trade, rainfall and yield data), not all global databases show year-specific data (e.g. reference evapotranspiration, crop growing area and irrigation data). The estimated water footprints of agricultural products are necessarily ten-year averages, because they have been based on climate data, which are by definition multi-year averages (Mekonnen and Hoekstra, 2010a). Furthermore, a trend analysis over a ten-year period would have been difficult due to the natural inter-annual variability of rainfall and temperature. The water footprints of industrial production and domestic water supply are geographically spread according to population densities.

The global water footprint related to agricultural and industrial production and domestic water supply for the period 1996-2005 was 9087 km³/y (74% green, 11% blue, 15% grey; see Table

1). Agricultural production takes the largest share, accounting for 92% of the global water footprint. Industrial production contributes 4.4% to the total water footprint and domestic water supply 3.6%. The global water footprint related to producing goods for export is 1762 km³/y. In the agricultural sector, 19% of the total water footprint relates to production for export; in the industrial sector this is 41%. The water footprint related to domestic water supply does not relate to export at all. Taken as an average over the three water-using sectors, they find that 19% of the global water footprint is not for domestic consumption but for export. The results are available in a 5 by 5 arc minute grid as an average over the 10-year period and can be downloaded from WFN's WaterStat database.

AT A GLANCE



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PROJECT COORDINATOR

Royal Netherlands Meteorological Institute (KNMI)

Bart van den Hurk

bart.van.den.hurk@knmi.nl

PROJECT COMMUNICATION

Arctik - Environmental communication

Riikka Pohjankoski

riikka.pohjankoski@arctik.eu

REPORT AUTHORS

Dr. Ertug Ercin, Daniel Chico Zamanillo and

Dr. Ashok Chapagain

ertug.ercin@waterfootprint.org



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