

# Challenges for the water environment of Jersey

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## Appendix C: Supporting economic information

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# 1. Introduction

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## 1.1 Economic requirements of the EC Water Framework Directive

The European Commission Water Framework Directive (EC WFD) requires the integration of economic and environmental analysis. The broad functions of this integrated analysis within the river basin planning process, as set out in the EC Common Implementation Strategy (CIS) guidance for economics (EC, 2004), are as follows:

- To carry out an economic analysis of water uses in each region;
- To assess trends in water supply, water demand and investments;
- To identify areas designated for the protection of economically significant aquatic species;
- To designate heavily modified water bodies based on the assessment of changes to such water bodies and of the impact (including economic impact) on existing uses and costs of alternatives;
- To support the selection of a programme of measures on the basis of cost-effectiveness criteria;
- To estimate the need for less stringent objectives based on an assessment of costs and benefits;
- To assess possible derogations for new activities and modifications based on economic considerations.

The economic analysis within the Jersey Integrated Water Management Plan (IWMP) draws on the principles of the EC WFD, but the approach used for the economic analysis also takes into account the experiences of Member States during implementation and the need for a Jersey-specific IWMP.

The section below outlines the approach used for the economic analysis within Jersey's IWMP.

## 1.2 Economic analysis within Integrated Water Management Planning

The key stages within the economic analysis for Jersey's IWMP can be summarised as follows:

1. An analysis of Jersey's socio-economic characteristics and forecasts to 2020.
2. An assessment of water uses.
3. An assessment of the current level of cost recovery for water services.
4. Identification of key trends and plans that may impact on water status.
5. An assessment of the most cost-effective combinations of measures for improving Jersey's water environment.
6. An analysis to determine whether any measure combinations are considered to be disproportionately costly.

This report presents the findings from stages 1-4 of the economic analysis, along with the proposed approach for stages 5 and 6, which will be undertaken during the next phase of the planning process.

## 1.3 Data sources

A number of key data sources have been used in compiling this report:

- The Jersey 2009 Water Resource Management Plan and appendices
- The States of Jersey 2008 Integrated Coastal Zone Management Strategy
- The States of Jersey Rural Economy Strategy 2011-2015
- The Jersey Island Plan 2011
- The 2013 'Jersey in Figures' statistics publication
- Abstraction licence and registration details held by States of Jersey Environment Division

- Jersey 2008 staying visitor survey
- Study on economic valuation of marine recreation activity in Wales (MPC, Atkins and PCF, 2013)

## 2. Economic analysis of water uses

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### 2.1 Socio-economic context of Jersey

This section of the report provides an overview of the socio-economic context of Jersey based on key statistics for the Island, which are the most recently available figures from the States of Jersey Statistics Unit (2013).

#### General profile

Jersey is the largest of the Channel Islands, situated 23 km (14 miles) off the north-west coast of France and 137 km (85 miles) off the south coast of England. The Island has an area of 120 km<sup>2</sup> (45 square miles) and a total resident population of approximately 99,000 (year-end 2012 figures). It is divided into 12 parishes: Grouville, St. Brelade, St. Clement, St. Helier, St. John, St. Lawrence, St. Martin, St. Mary, St. Ouen, St. Peter, St. Saviour and Trinity.

Jersey is a Crown Dependency and is not part of the UK; as such it is not represented in the UK Parliament. UK Acts of Parliament only apply in Jersey if agreed by the island that this should be the case. Jersey's economy has traditionally been dominated by agriculture and tourism. However, global changes in trade during the latter part of the 20th century have brought about significant growth in the financial services sector, which now accounts for approximately 40 per cent of total economic activity in Jersey and employs around 25 per cent of the workforce.

In 2012, 24 per cent of the land was built on, 54 per cent was used for agriculture, 17 per cent was natural vegetation and 1 per cent was inland water.

#### Population and households

##### Population

The estimated population of Jersey in 2012 was 99,000<sup>1</sup>, an increase of 900 since year-end 2011. Population increase is 44% natural growth and 56% inward migration. Migrants from countries that have recently joined the EU form the largest migrant group entering Jersey.

The resident population has steadily increased since the 1970s, with the most rapid growth rate between 2001 and 2011 (see Figure 2.1). In 2011, 66% of the population were of working age, with the remainder evenly split between residents above and below working age. These proportions have remained constant since 1981 although absolute numbers have increased.

The population is most heavily concentrated around the south-east coast in the parishes of St Helier, St Saviour and St Clement, the three parishes with the highest proportion of land use classified as built environment.

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<sup>1</sup> Estimate for 2012, States of Jersey

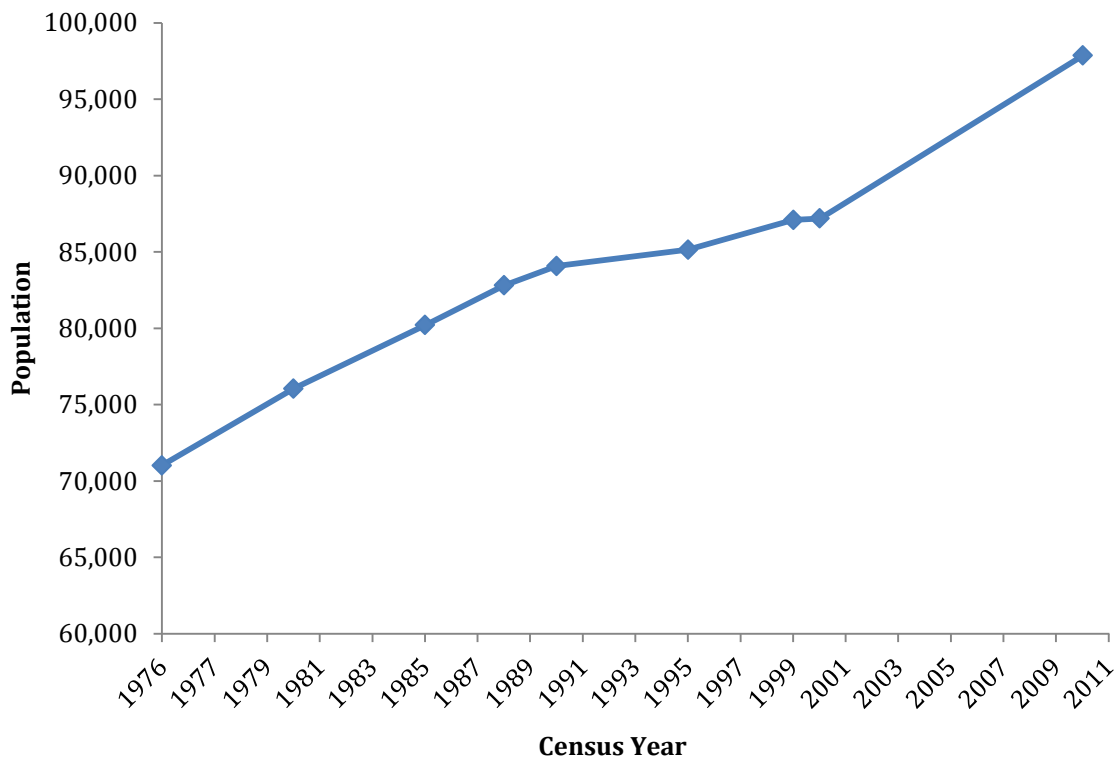


Figure 2.1: Resident population growth 1976-2011 (Census data, States of Jersey)

### Households

The number of private households in Jersey recorded in the 2011 Census was 41,595. Of this, 54% are owner-occupied, 19% are privately rented and 14% of households are living in social housing (Figure 2.2). The remaining 14% is divided between private lodging, staff accommodation and other accommodation. These proportions have remained relatively constant since 2001. The average number of people per household is 2.31.

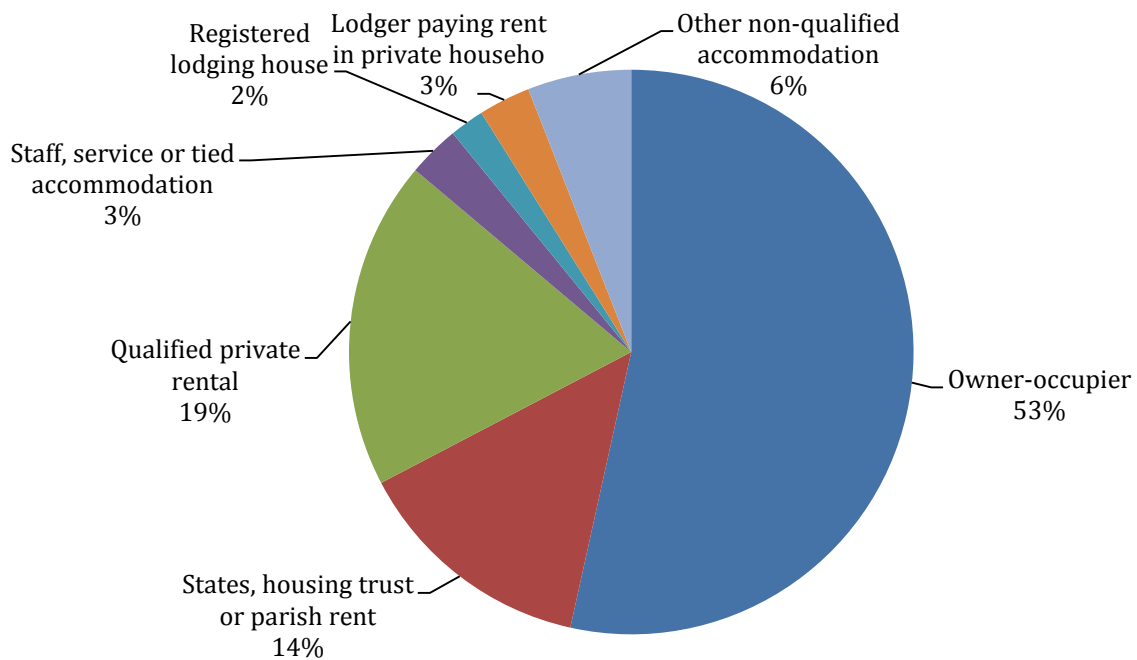


Figure 2.2: Households by type, 2011 Census data

### Property Type

The majority of people in Jersey live in flats/maisonettes (44%), whilst 26% live in detached houses and 30% in semi-detached (Figure 2.3).

Over four-fifths of dwellings have between one and three bedrooms. The majority of rental accommodation has either one or two bedrooms with nearly two-thirds of non-qualified accommodation having one bedroom. In contrast, almost seven out of ten of owner-occupier households have three or more bedrooms.

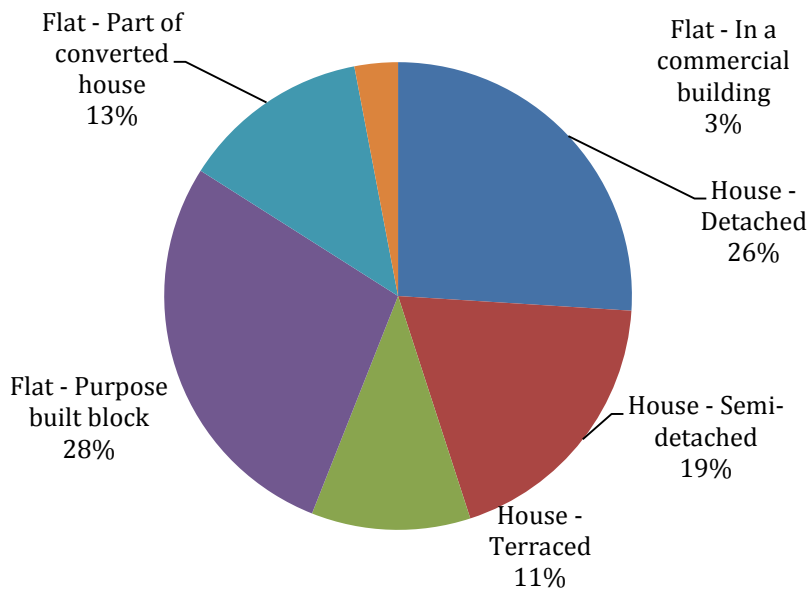
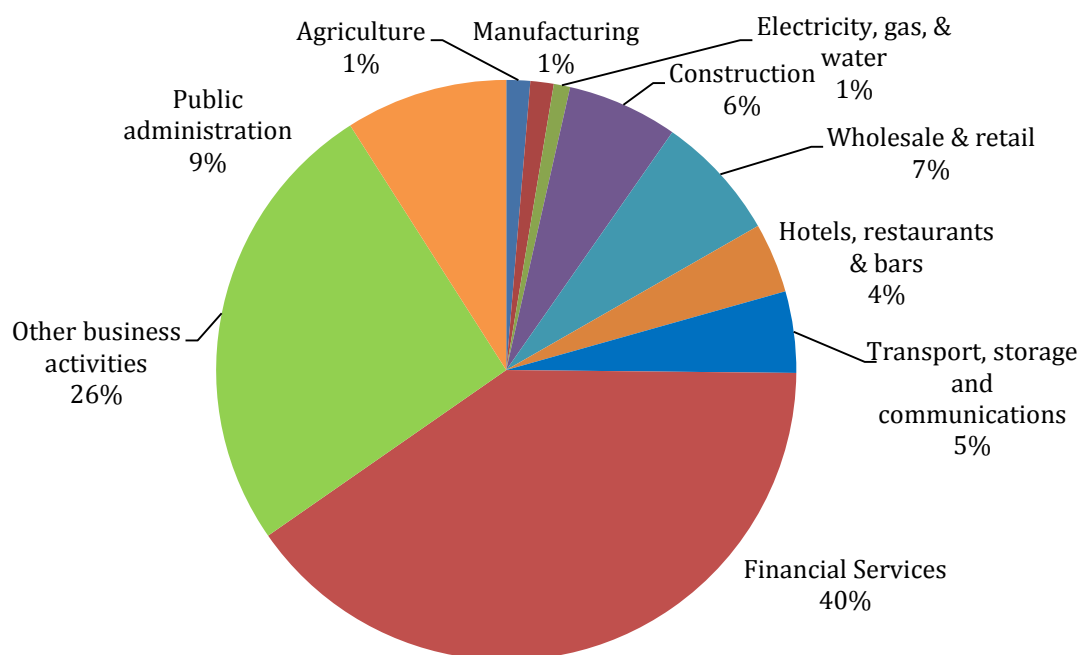


Figure 3.3: Property by type, 2011 census data

## Economy

In 2012, the total Gross Value Added (GVA)<sup>2</sup> for Jersey was £3.6 billion (at basic prices<sup>3</sup>), 40% of which came from financial services (see Figure 2.4). There has historically been a strong relationship between the finance industry and the overall economy of Jersey. Economic growth before 2000, and subsequent periods of decline, growth and decline have been a result of fluctuations in the finance industry, with essentially stable real-term GVA for non-finance sectors of the economy over the longer-term (Figure 2.5).



**Figure 2.4: Gross Value Added by sector, 2012 figures. The 'Other business activities' sector comprises a range of services (principally businesses servicing households or other businesses) and includes rental income of private households, both actual and imputed.**

Over the past decade, however, many individual sectors have experienced significant percentage changes in GVA (Figures 2.6). GVA from rental income, the construction sector and public administration sectors have experienced the largest percentage increase, whereas the manufacturing sector has experienced the largest relative decrease in GVA.

<sup>2</sup> According to the UK Office for National Statistics, Gross Value Added "measures the contribution to the economy of each individual producer, industry or sector in the United Kingdom". It can be seen as the sum of profits of businesses and earnings of employees (States of Jersey, 2013).

<sup>3</sup> According to OECD basic price "is the amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any tax payable, and plus any subsidy receivable, on that unit as a consequence of its production or sale; it excludes any transport charges invoiced separately by the producer." (OECD, 2013).

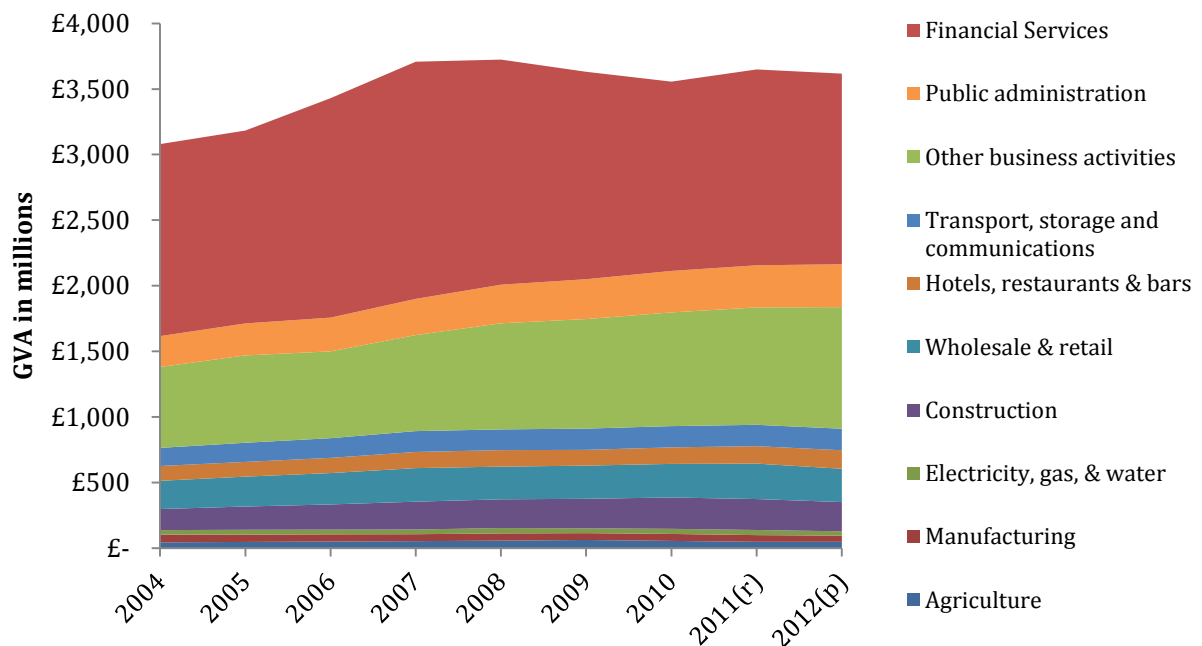


Figure 2.5: Gross Value Added (basic) by sector from 2004 to 2012 at current year values. (r) = revised, (p) = provisional.

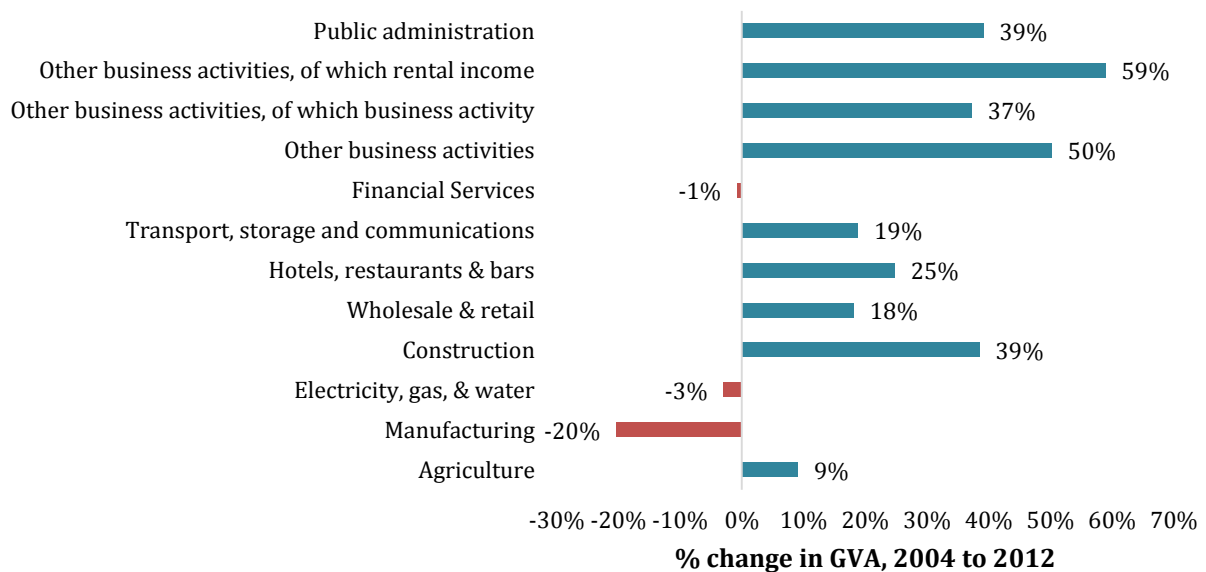


Figure 2.6: Percentage change in Gross Value Added (basic) by sector from 2004 to 2012.

GVA per capita can be used as an indicator of economic standard of living for Jersey residents. The Island's GVA per capita in 2012 was £36,700 (in current year values). This has decreased by 21% between 2008-2012 (inclusive) as a result of an increase in resident population and a real term decrease in GVA.



GVA per employee can be used as an indicator of productivity or economic output produced per employee, by dividing GVA by the total number of full-time equivalent (FTE)<sup>4</sup> employees. GVA per employee in 2012 in current year values was £61,000.

Mean GVA per employee is highest for the finance sector at £120,000 per FTE, almost three times that of other industries (Figure 2.7). The lowest GVA per FTE was seen in the hotels, restaurants and bars, agriculture, and wholesale and retail sectors.

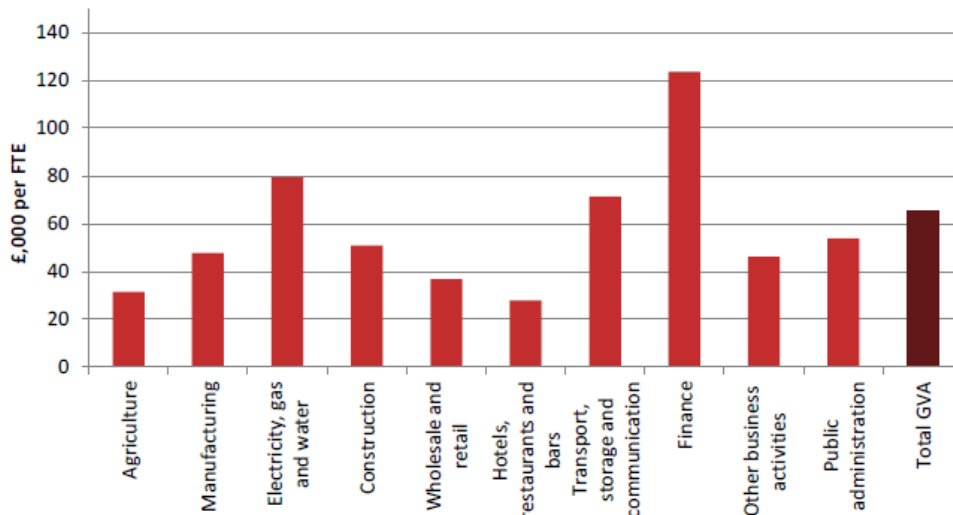


Figure 2.7: GVA per full-time equivalent employee in 2012 (current values). Taken from "Jersey in Figures 2013"

### Agriculture

In 2012, agricultural land occupied 57% of the Island's area, an increase of 24 hectares since 2011. The main crop, in terms of monetary value, is potatoes with a value of £27 million in 2012. The value of arable exports decreased between 2011 and 2012, from £32 million to £28.9 million.

The total number of cattle in 2012 was 5,150, with 2,931 animals in milk. Despite a small increase in 2011, the total number of milking cows has decreased from 3,050 in 2008. However, both volume of milk produced and value of dairy exports have increased since 2008 (Figure 2.8).

<sup>4</sup> The number of full-time equivalent employees is calculated by assigning a full-time employee a weight of 1 and a part-time employee a weight of 0.5.

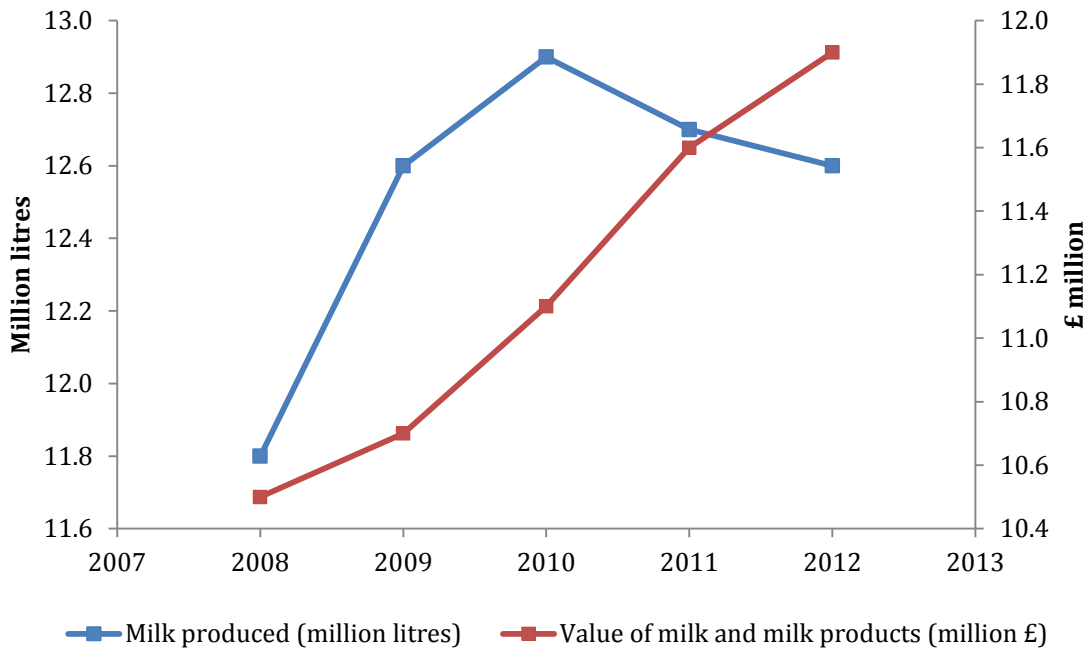


Figure 2.8: Milk production and value, 2008-2012

### Employment

In June 2013, a total of 56,290 people were employed in Jersey. This employment total represents a decrease of 110 on June 2012 and is more than 600 less than in June 2011, when employment was at the highest level recorded for at least 15 years.

The finance sector represents over one fifth of employment and is Jersey’s highest employing sector (Figure 2.9). Wholesale and retail trades, hotels, restaurants and bars and the public sector (excluding States Trading Committees) each employ approximately one eighth of Jersey’s labour market.

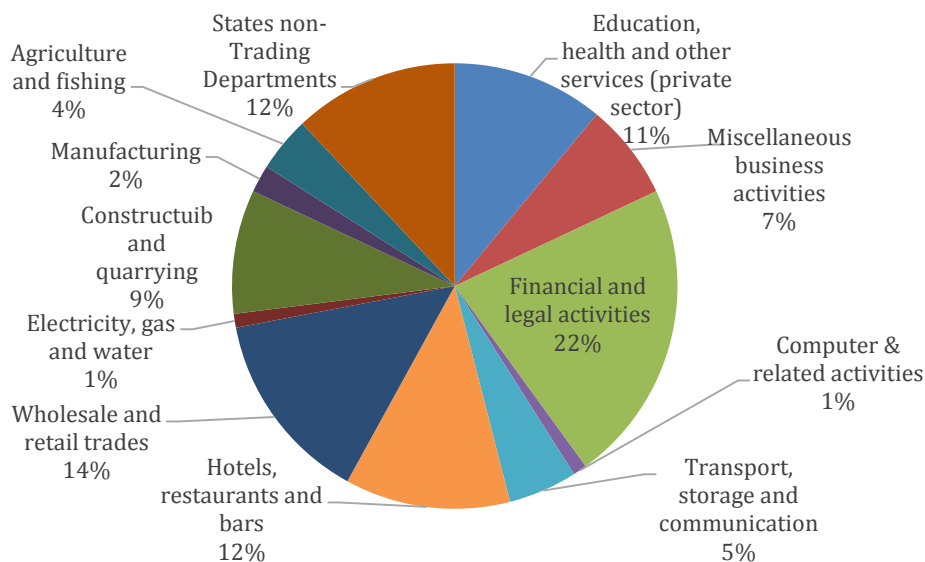


Figure 2.9: Sectoral Breakdown of Employment (headcount), June 2013

In June 2013 Jersey's ILO unemployment rate<sup>5</sup> was 5.7%, corresponding to 3,200 people unemployed. The number of people registered as actively seeking work (ASW) increased from 840 in 2009 to 1,860 in 2014. The peak ASW was 2,045 in March 2013.<sup>6</sup>

## Other socio-economic characteristics

### Tourism

The total number of visitors to the island fell between by 31% 1996 and 2013 (Figure 2.10). The total on-island visitor expenditure was £228 million in 2013. The number of registered bed spaces has fallen by 42% since 1998.

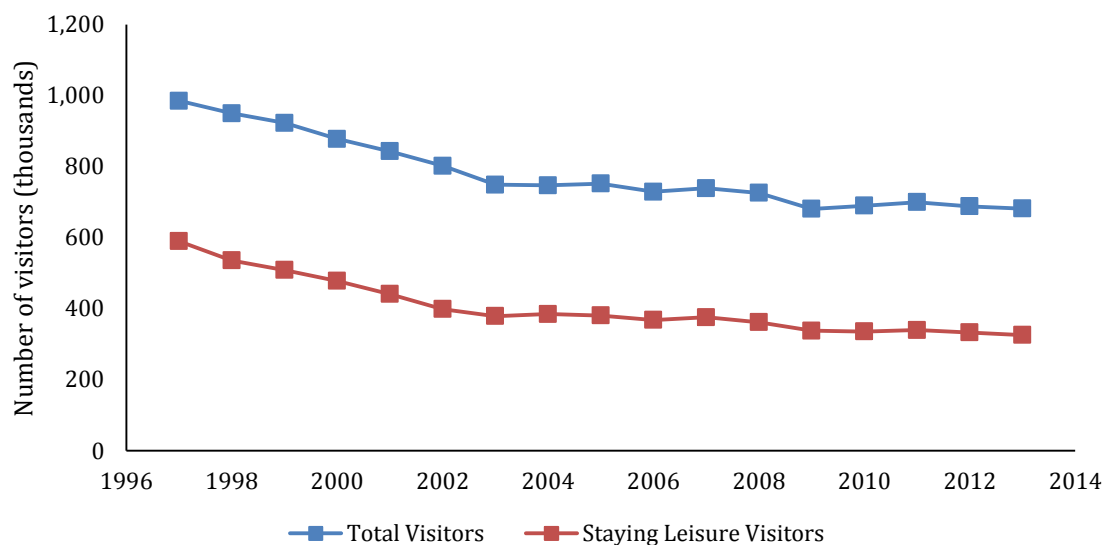


Figure 2.10: Number of staying leisure visitors and total visitors 1997-2013. Taken from "Jersey in Figures 2013"

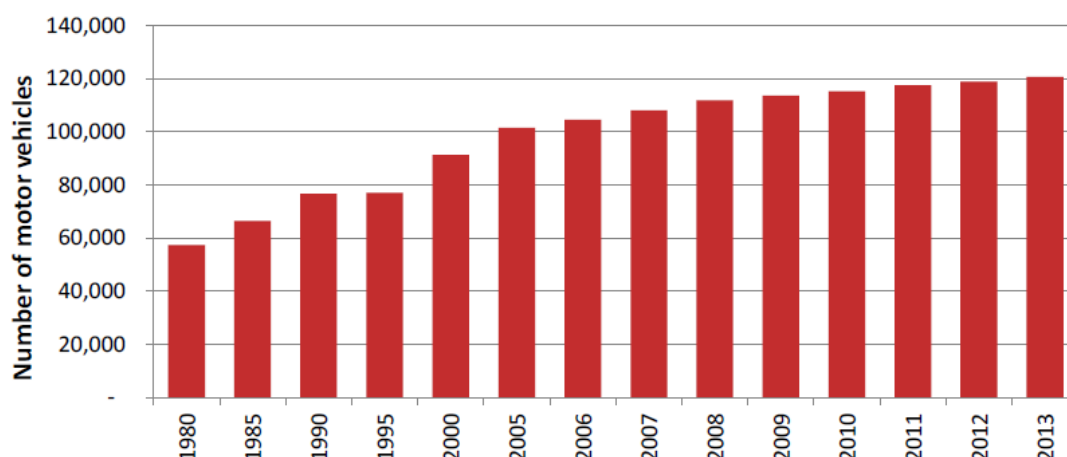
### Transport

In December 2013 there were 120,671 vehicles recorded on the Driver and Vehicles Standards (DVS) register, representing a net increase of 1,800 since 2012<sup>7</sup> (see Figure 2.11). In 2013, 56 hybrid vehicles were registered and 20 electric vehicles. The average number of vehicles per household was 1.5 as recorded in the 2011 Census.

<sup>5</sup> The International Labour Organisation (ILO) definition of unemployment includes all adults (aged 16 and over) who are not working but are looking for or waiting to take up a job. Figures for Jersey are calculated from the 2011 Census and the Jersey Annual Social Survey.

<sup>6</sup> There is no requirement in Jersey for those unemployed to register as actively seeking work, therefore this measure is an indicator rather than measure of unemployment.

<sup>7</sup> This may be higher than the actual number of vehicles because some lie unused or have been disposed of but still remain on the DVS register.



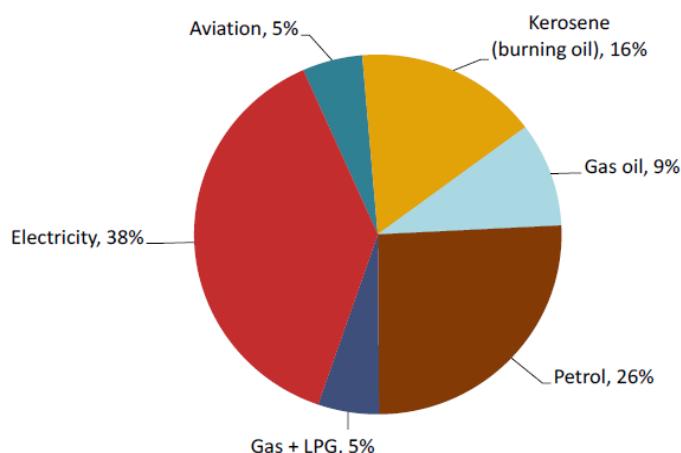
**Figure 2.11: Total number of vehicles registered in Jersey, 1980-2013<sup>8</sup>**

Figures include all cars, tractors, motorbikes etc, and commercial and private vehicles. Figures up to 1993 include only taxed vehicles; figures from 1994 onwards include all vehicles recorded on the DVS register as at 31 December of each year.

### Energy and Environment

Jersey is a signatory of the Kyoto Protocol and as such is committed to reducing its greenhouse gas emissions. In order to achieve this, Jersey switched its main electrical energy supply from an on-Island oil-fired plant to imported electricity from the European Grid. However, in June 2012 the original submarine cable from France failed permanently, so Jersey Electricity plc are generating a proportion of its electricity on-Island, causing a temporary rise in greenhouse gas emissions.

In 2011, total final energy consumption in Jersey was 168,040 toe (tonne of oil equivalent) (1.95 million MWh). Final energy consumption has decreased on an annual basis for each of the last two calendar years.



**Figure 2.12: Jersey's total energy consumption by fuel type (2011)**

## 2.2 Water uses in Jersey

This section presents information on water uses within Jersey, covering both abstractions and discharges. Abstractions from water bodies are undertaken for a range of different purposes, including providing drinking water for households and business and for irrigation.

<sup>8</sup> Derived from data published in the General Lifestyle Survey 2010; Office for National Statistics.

In 2013 Jersey Water supplied 7,047 million litres of water to approximately 38,000 homes and businesses from two water treatment works. Jersey’s water resources are nearly all derived from rainfall dependent surface waters with only around 2% being from groundwater. Of the total volume supplied, nearly 90% is for domestic use, the remaining 10% being spread across a wide range of uses including small businesses, community facilities and tourism.

Jersey Water collects and stores raw (untreated) water in six storage reservoirs with a capacity of 2,687 million litres, which is equivalent to approximately 120 days of average demand. The maximum daily water demand fell between 2010 and 2013 from 25.8 MI/d to 19.3 MI/d. The number of new water connections increased in this period from 337 in 2010 to 406 in 2013.

There are also over 3000 private water supplies on the Island, with the vast majority being groundwater abstractions. Approximately 10% of the population are served by private groundwater sources. Based on information being collected through the abstraction licensing and registration systems, it is estimated that recent actual groundwater abstraction totals just over 2,000 million litres of water. The breakdown by use is summarised in Table 3.1. It should be noted that the quantity for quarry dewatering is based on abstraction from sumps/pits and potentially includes a significant proportion of runoff. Under dry conditions dewatering abstraction rates will be lower than at other times of the year.

**Table 3.1 Breakdown of recent actual groundwater abstraction quantities by use**

| Quarry dewatering | Domestic | Business | Agriculture | Amenity and public service | Jersey Water | Horticulture |
|-------------------|----------|----------|-------------|----------------------------|--------------|--------------|
| 29%               | 26%      | 18%      | 11%         | 7%                         | 6%           | 2%           |

There is a single wastewater treatment facility on the Island at Bellozane, serving domestic properties and businesses on mains sewerage. For properties that are not on mains sewerage wastewater treatment is provided by on-site treatment facilities such as septic tanks, soakaways and small package treatment plants.

## 2.3 Cost recovery of water services

### Water supply

The water charges for domestic properties were originally based on the rateable value of the property. Up until 2004, most metered connections were commercial customers or shared connections with a shop and flat(s). In 2004 all new domestic connections were metered and from 2007 all domestic properties changing ownership were metered. The metering policy was further strengthened in 2010 when universal metering was announced for all customers. In 2014, 80% of connections are metered and it is planned to have the majority of remaining connections metered by the end of 2015.

Jersey Water’s policy is to meter all connections, including fire supplies, regardless of the ability to charge by volume. This then allows private pipe leakage to be identified and misuse of fire supplies. Where multiple properties are connected by a single service connection, the property owner is offered additional free connections to separate supplies. If this is not taken up water charges are based on an assumed volumetric demand based on the number of occupants.

The water charge is made up of two elements, a fixed standing charge and the volumetric charge. Up until 2013, the service charge of £5 per quarter (£20 pa) was the same for all customers, domestic and commercial. From 2013 the standing charge was changed to take into account the size of the connection, there has been no change to the charge domestic customers pay, but a sliding scale charge for larger sized connections was introduced which are to commercial customers.

## Wastewater treatment

Wastewater treatment in Jersey is centralised and controlled by the Transport and Technical Services Department (TTS). The Bellozanne sewage treatment works, which dates back to the 1950s and discharges treated water into St Aubin's Bay, is Jersey's main sewage works, with the only other treatment within a small package treatment plant located at Bonne Nuit (States of Jersey, 2014b).

The TTS is currently investigating the potential expansion of the Bellozanne treatment works, in order for the discharge to meet required water quality standards and to meet demand from the growing Jersey population (Parsons Brinckerhoff, 2012). It is anticipated that this upgrade would have a positive impact on the water status of the St Aubin's Bay.

Wastewater treatment is provided centrally for properties on mains sewerage. In accordance with Jersey laws, the cost of wastewater treatment is not fully recoverable but is partly funded by the States of Jersey.

## 2.4 Economic impact of water-based recreation

Water-based recreation is a popular activity on the Island, with a wide range of activities available. In order to estimate the impact of water-based recreation on the economy of Jersey, a high level assessment has been undertaken of expenditure related to this type of activity.

Based on this assessment, the value of water-based recreation to the Jersey economy is estimated to be between £2.8 million and £4.4 million per year (see Table 3.2 below). The figures are based on the results of a UK staying visitor survey undertaken by States of Jersey in 2008<sup>9</sup>, leisure staying visitor numbers in 2013 (States of Jersey, 2013) and recreation expenditure values from a range of sources, collated by MPC, Atkins and PCF (2013).

The assessment is likely to underestimate the total value of water-based recreation because it does not include day trippers, visiting yachtsmen or business visitors (these sectors could account for a large amount of revenue, with an estimated 19,900 visiting yachtsmen, 101,300 day trippers and 112,700 business visitors estimated in 2013) and it does not take account of local residents' expenditure on these activities.

In addition, the participation rates for activities are based on a survey that covers UK staying leisure visitors only. It is therefore assumed that the same participation rates apply to staying visitors from other countries. Furthermore, the survey report states that it is likely to be biased towards those who stayed for a longer period in Jersey, and towards more elderly visitors as they are more likely to complete the questionnaire. Therefore participation rates for water-based recreation may be underestimated.

Expenditure values used are from a range of sources, and have been analysed and collated in a study on the value of marine recreation activity in South Wales (MPC, Atkins and PCF, 2013). The expenditure values apply to both local resident and visiting activity participants, include all types of expenditure associated with the trip expenditure (e.g. food, accommodation and travel) and take non-paying participants into account. Therefore they are likely to underestimate the expenditure of visiting activity participants.

These expenditure values have been multiplied by the total number of staying visitor days, calculated by multiplying the number of staying visitors by average length of stay. It is therefore assumed that staying visitors participate in an activity on all days of their stay, which may overestimate the number of participant days.

However, given that total on-Island visitor expenditure in 2013 was £228 million, these figures are considered to be reasonable estimate of the value of water-based recreation on Jersey.

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<sup>9</sup> <http://www.jersey.com/business/Visitor%20Surveys/2008%20Summer%20Visitor%20Survey.pdf>

Table 3.2 Estimated annual expenditure on water-based recreation of staying visitors in Jersey

| Activity participated in  | Value to Jersey economy (2013/14 prices) - staying visitors only |                   |                   |
|---------------------------|--|-------------------|-------------------|
|                           | Average  | Lower bound       | Upper bound       |
| <b>Other water sports</b> | £499,000   | £393,000          | £616,000          |
| <b>Surfing</b>            | £367,000   | £271,000          | £479,000          |
| <b>Fishing</b>            | £854,000   | £683,000          | £1,060,000        |
| <b>Diving</b>             | £831,000   | £796,000          | £1,070,000        |
| <b>Kayaking</b>           | £189,000   | £161,000          | £209,000          |
| <b>Blokarting</b>         | £141,000   | £104,000          | £184,000          |
| <b>Wind/kite surfing</b>  | £141,000   | £104,000          | £184,000          |
| <b>Jet/water skiing</b>   | £223,000   | £164,000          | £286,000          |
| <b>Sailing</b>            | £222,000   | £125,000          | £336,000          |
| <b>Total</b>              | <b>£3,470,000</b>  | <b>£2,800,000</b> | <b>£4,420,000</b> |

## 3. Key economic trends and plans

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The following section examines the key trends and plans in sectors that are particularly important in relation to water status in Jersey. These are grouped in terms of households, industry and agriculture, which represents the groupings of water users specified in the EC WFD. Additional plans and investments that could have an impact on Jersey's water environment are also summarised. An assessment is then made of the potential direction of impact on water status over the time horizon of the IWMP.

### 3.1 Population and households

Water supply to households within the States of Jersey is provided predominantly by Jersey Water, with around 10% of the population being on private supplies. The Company published its current Water Resources Management Plan (WRMP) in 2009, covering the period 2007-2032, and is due to publish its next plan in 2014.

The 2009 WRMP forecasts an 11% reduction in water supply and 15% increase in water demand by 2032. This is predicted to result in a shortfall of 6.5 MI/d by 2032 during a 1 in 50 year drought.

The projected shortfall is driven by an increase in demand due to population growth, in addition to a reduction in supply due to climate change, with population growth being the most significant influence. As part of the development of Jersey Water's WRMP, a series of population growth scenarios were produced for 2007 to 2032, ranging from zero net change to +650 per annum. The baseline population increase assumed within Jersey Water's WRMP was +250 per annum, although recent population growth has exceeded this (see Figure 2.1). Climate change impacts were expected to increase water demand over this period by 1.8% (MWH, 2009).

Implementation of the supply side options required in order to avoid this shortfall may have the potential to negatively affect water status. These are as follows:

- Increase groundwater abstraction in St Ouen's Bay
- Increase reservoir storage Val de la Mare Reservoir

The WRMP states that additional abstraction of 1 MI/d or possibly 2 MI/d from the sand aquifer in St Ouen's Bay is feasible without any adverse impacts on the environment or ecology of the area, based on preliminary work. Further assessment is likely to be required to determine whether this could negatively affect water status.

The increased reservoir storage option also has the potential to negatively affect water status, depending on any change in abstraction regime required and impacts on conditions in the reservoir itself.

### 3.2 Industry

In the context of SWMI and the States of Jersey, the term 'industry' is used to refer to the manufacturing and mineral extraction industries. Currently the only minerals actively worked on the Island are sand and stone, with extraction taking place at several sites on land and in the coastal zone. The Island Plan 2011 notes that although marine dredging for aggregates does not currently take place, there is at least one suitable area from which sand and gravel could be extracted. Although the Plan cites the numerous issues associated with marine dredging, it could turn out to be a potential pressure on the marine environment in the longer-term.

In terms of water consumption, there is no significant industrial usage currently on Jersey and this anticipated to remain the case at least over the forthcoming two decades (MWH, 2009).

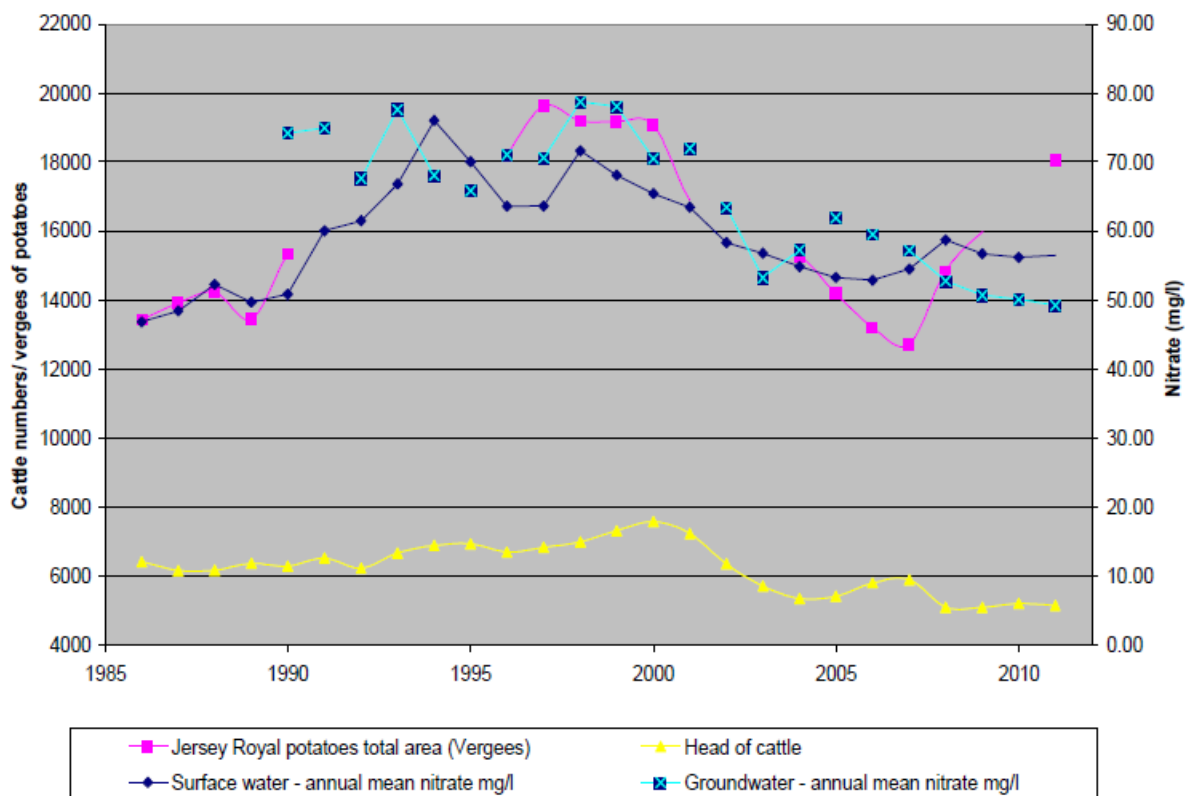


### 3.3 Agriculture

Agriculture in Jersey represents a significant water use. In addition, agriculture can represent a significant source of diffuse pollution. According to the States of Jersey (2014a):

***“In Jersey, the link between nutrient losses from agriculture and high nitrate concentrations in surface and groundwater is well established. Agricultural activities are not the only source, but as agricultural land occupies over 50% of the island’s area, they have a significant impact.”***

The main crop grown on Jersey, in terms of financial value, is potatoes, followed by tomatoes (States of Jersey, 2013). Agricultural data (see Section 3 above) show that between 1986 and 2000 there was an increase in the area of land used to grow Jersey Royal potatoes, from almost 14,000 vergées (2,510 hectares) to almost 20,000 vergées (3,585 hectares). This was followed by a decline after the year 2000 to just over 12,000 vergées (2,151 hectares) in 2007, although 2011 data show a sharp increase from this low point to 18,000 vergées (3,223 hectares). The graph in Figure 3.1 below shows a strong apparent correlation between the area of land used for potato crops (as well as the number of cattle) and annual mean nitrate levels in surface and groundwater.



**Figure 3.1: Nitrate in water and agricultural trends.** Source: <http://www.gov.je/SiteCollectionDocuments/Environment%20and%20greener%20living/ID%20Diffuse%20pollution%20graph.pdf>

The 2011-2015 Rural Economy Strategy (expected in late 2014) for the States of Jersey states that this dependence on a single crop has resulted in an increase in continuous cropping, which can lead to the build-up of pests and diseases. This indicates that should strong growth in potato production continue, this may exert increased pressures on water quality as well as quantity, although there are a number of schemes in place that are attempting to reduce diffuse pollution pressures; see below. Consultation on a draft Rural Economy Strategy for the next period is expected to begin later in 2014.

Dairy farming in Jersey, whilst being of historical and cultural importance, has experienced declining profitability in recent decades, resulting in a restructuring to bring production in line with demand through a reduction in the number of cattle (States of Jersey, 2011a). Agricultural data show that between 1986 and 2000 there was a relatively steady increase in the number of cattle on Jersey, from just over 6,000 to almost 8,000. This was followed by an overall decline to 2011, when there were approximately 5,000 cattle.

The industry is still reliant on a high level of government subsidy, and plans are in place to improve the efficiency and profitability of the industry, which were formulated as part of the dairy industry's 'Road Map to Recovery', published in 2004 (States of Jersey, 2011a). The Rural Economy Strategy (States of Jersey, 2011a) states that at the time of writing in 2011 producers had been asked to increase milk output for the first time in five years, although 2013 figures show that milk production fell by 1% for the year ending 31<sup>st</sup> March 2013 compared to the previous year (States of Jersey, 2013). It is therefore difficult to predict how diffuse pollution pressures from cattle production will change over the time horizon of the IWMP.

#### Diffuse pollution prevention activities

The 2011-2015 Jersey Rural Economy Strategy describes a number of new or enhanced policies and schemes that aim to reduce diffuse pressures from the agricultural sector.

- The **Diffuse Pollution Project**, established by the States of Jersey Environment Division, is a voluntary scheme that works with land owners and users to understand diffuse pollution issues and implement agricultural best management practices in several water catchments. Water quality in these catchments will be monitored throughout to assess the impacts of the measures. The intention is that lessons learned from this pilot scheme will be used to develop strategies for use across Jersey.
- The **Countryside Renewal Scheme**, which was established in 2005, aims to support and improve biodiversity, reduce pollution, support environmentally sustainable farming and improve access to the countryside. It offers grants to support a range of voluntary environmental projects.
- Each farmer or landowner receiving public support must now have a farm **environment plan**, which aims to ensure that all farms have soil protection and water management measures in place, including a nutrient management plan.

Assuming that such policies are continued to 2020, they are likely to have a positive impact on water status.

### 3.4 Other investment plans that may affect the water environment

#### Land reclamation

The States of Jersey Island Plan 2011 provides a summary of the history of reclamation of the St Helier foreshore, which has taken place for at least 200 years. Given the competing pressures of ports and harbours, fisheries, aquaculture, agriculture, mineral extraction, industry, housing development, tourism and power generation on coastal land and marine resources, there is potential for further land reclamation to take place over the time period of the IWMP, if considered to be in the Island's urgent strategic interest (States of Jersey, 2008; 2011b). This would result in the loss of ecologically valuable marine habitat.

#### Regeneration of St. Helier

The town and port of St. Helier is currently a focus for regeneration activity, and several changes are likely to take place over the period of the IWMP. Between 2014 and 2015 works are scheduled to remove a bridge and improve several pontoons within St Helier Harbour. Any further development that could affect water status may need to be taken into account within the IWMP.

The States of Jersey Island Plan 2011 states that in the longer-term there may be a need for a new port as the current facilities are ageing and inefficient. Feasibility work has indicated that this could be sited at La Collette, which has significantly deeper water (States of Jersey, 2011b). This could affect water status in the longer-term rather than over the period of the IWMP.

### **Shipping activity**

Any changes in levels of shipping activity could affect the status of coastal water bodies over the period of the IWMP. Almost all freight into and out of Jersey is through the Port of St Helier (States of Jersey, 2011b). Between 2006 and 2016 there was a relatively steady decline in the number of tonnes of freight shipped through St Helier Harbour, from 418,000 tonnes in 2006 to 351,000 tonnes in 2013 (States of Jersey, 2013). The number of sea passengers also declined between 2002 and 2013, from approximately 919,000 in 2002 to 719,000 in 2013. This indicates a declining trend in freight and sea transport activity in the Port of St Helier, which may reduce the pressure on the marine environment.

However, by 2018 one of the main aggregate extraction operations on the Island will be wound down (Simon Sand and Gravel Ltd., St. Ouen's Bay) so there may be an increase in the import of sand for the construction industry, according to the States of Jersey Island Plan 2011, which could increase the volume of freight after this point.

### **Energy generation**

Opportunities have been identified for tidal power harvested from Jersey's territorial waters 'to make a significant and increasing contribution to the energy requirements and security of the Island for the rest of this century' (2008 report from the Tidal Power Steering Group, referenced in States of Jersey, 2011b). The Island Plan 2011 notes that a significant investigation may be required to establish the optimum locations for potential installations and their long-term viability. It also notes the potential for off-shore wind energy generation in Jersey's waters. There is potential for tidal power prototypes and future permanent tidal and wind schemes in the longer-term to have adverse impacts on the marine environment, although such schemes are unlikely to be approved if impacts are considered to be significant.

### **Designation of Coastal National Park**

The States of Jersey Island Plan 2011 proposed the identification and designation of a Coastal National Park within Jersey, covering Jersey's south west headlands, St Ouen's Bay in the west, the north coast, St Catherine's Bay and part of Grouville Bay in the east, and the offshore reefs and islets, including the Écréhous and the Minquiers. The Department of the Environment, together with stakeholders, is currently working out the practicalities of how the park will function. However, the Island Plan 2011 states that there will be a presumption against all forms of new development within the Coastal National Park, as well as against the redevelopment of existing buildings for new uses. This may act to reduce or limit certain pressures on water status during the period of the IWMP.

In addition, the Island Plan 2011 extended the boundaries of the existing Green Zone to cover areas with an 'intact landscape character and an important range of environmental features needing a high level of protection from development'. The Island Plan states that there will be a strong presumption against new development in Green Zone Areas, with exceptions where development proposals do not serve to detract from or harm the character of the area. As with the Coastal National Park, this may act to reduce or limit pressures on water status due to new development over the period covered by the IWMP.

## 4. Next steps

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Following the publication of the Significant Water Management Issues report and the corresponding public consultation, the next phase will involve preparation of the Draft Integrated Water Management Plan for Jersey. As part of this, programmes of measures will be developed to tackle the significant water management issues on Jersey, followed by measures appraisal and finalisation of the programmes of measures.

As part of the preparation of River Basin Management Plans (RBMPs) the EC WFD requires Member States to:

***“make judgements about the most cost-effective combination of measures in respect of water uses to be included in the programme of measures under Article 11 based on estimates of the potential costs of such measures”*** (Annex III).

In addition, in recognition of the ambitious overarching objective of the WFD to achieve good status in all water bodies, Article 4 of the WFD provides a number of possible exemptions and their conditions. It states that the deadline for achieving environmental objectives may be delayed or such objectives reduced where the measures required would be ‘disproportionately costly’, technically infeasible or where natural conditions prevent such objectives being met.

The EC CIS guidance prepared in 2004 does not contain any specific guidance for the approach that should be used for identifying the most cost-effective combinations of measures and for providing justification that the achievement of environmental objectives would be disproportionately expensive. As demonstrated in the supporting documents to the EC WFD Third Implementation Report, and a number of published papers, Member States have therefore used a variety of approaches in order to fulfil this requirement (Acteon, 2012; Balana, et al., 2011).

### 4.1 Identifying cost-effective measure combinations

For the Jersey IWMP the approach is likely to draw on that developed in England and Wales for the first and second RBMPs. This used a scoring system for effectiveness together with a database of costs, supplemented with locally-specific cost information, in order to determine the most cost-effective measure combinations that achieve good status for all water bodies. This will be carried out on the scale of the island as a whole to ensure consistency in the approach used across all water bodies. During preparation of the Draft IWMP we will be consulting closely with the States of Jersey in order to define and refine the approach used.

### 4.2 Disproportionate cost analysis

The WFD does not provide a definition of what constitutes a ‘disproportionate cost’; the interpretation of this term has therefore differed between Member States. The term itself implies that in order to justify the disproportionality of costs, they must be compared against a benchmark (Ammermüller et al., 2011).

In some Member States, attempts have been made to use full monetary cost-benefit analysis in order to provide a benchmark of benefits against which the measure costs can be compared. The calculated monetary benefits have included non-market benefits in some cases, such as the benefits to biodiversity and to the recreational enjoyment of those visiting the water body.

Other countries have steered away from full monetary cost-benefit analysis and have developed alternative approaches. For example, a method has been developed in Germany for undertaking a disproportionate cost analysis using a non-monetary benefits evaluation. The approach used for Jersey’s IWMP is likely to draw on this pragmatic method, given the difficulty and high resource requirements of full monetary cost-

benefit analysis. However, as with the cost-effectiveness analysis, we will be consulting closely with the States of Jersey in order to develop ensure select and refine the most appropriate approach to use for the island.

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