



UK

National report

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Pictures: Inshore fishing boats, Cornwall & Dairy cow, Somerset

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UK National report

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Abbreviations used

AHDB	Agriculture and Horticulture Development Board
ACOM	Advisory Committee
APHA	Animal and Plant Health Agency
BBC	British Broadcasting Corporation
BPS	Basic Payment Scheme
BRC	British Global Standards
bTB	Bovine Tuberculosis
BVD	Bovine Viral Diarrhoea
CAP	Common Agricultural Policy
CDC	Cornwall Development Company
CEFAS	Centre for Environment, Fisheries and Aquaculture Science
CFCA	Community Fisheries Control Agency
CFP	Common Fisheries Policy
CFPO	Cornish Fish Producers' Organisation
CMO	Common Market Organization
CSA	Community Supported Agriculture
CSF	Community Supported Fishing
CSMA	Cornish Sardine Management Association
DEFRA	Department for Environment Food & Rural Affairs
DFQC	Duchy Fish Quota Company
EAFM	Ecosystem Approach to Fisheries Management
EC	European Commission
EEZ	Exclusive Economic Zone
EFCA	European Fisheries Control Agency
EFF	European Fisheries Fund
EMFF	European Maritime and Fisheries Fund
EMS	European Marine Sites
EP	European Parliament
ERDF	European Regional Development Fund
ESF	European Social Fund
EU	European Union
FAO	Food and Agriculture Organization
FAWC	Farm Animal Welfare Council
FBI	Farm Business Income
FBS	Farm Business Survey
FIFG	Financial Instrument for Fisheries Guidance
FIPs	Fishery Improvement Projects
FLAG	Fisheries Local Action Group
FoS	Friend of the Sea
FPOs	Fisheries Producer Organisations
FQAs	Fixed Quoted Allocations
FSA	Food Standards Agency
GDP	Gross Domestic Product
GM	Genetically Modified

GMO	Genetically Modified Organism
HACCP	Hazard Analysis and Critical Control Point
IBR	Infectious Bovine Rhinotracheitis
ICES	International Council for the Exploration of the Sea
IFCA	Inshore Fisheries and Conservation Authority
LAG	Local Action Group
LEADER	Links between actions for the development of the rural economy program
LEPs	Local Enterprise Partnerships
LFA	Less Favoured Areas
LQ	Location Quotient
MCAA	Marine and Coastal Access Act
MCS	Marine Conservation Society
MCZs	Marine Conservation Zones
MLR	Maximum Residue Limits
MMB	Milk Marketing Board
MMO	Marine Management Organisation
MPA	Marine Protected Area
MS	Member State
MSC	Marine Stewardship Council
NEF	New Economic Foundation
NFFO	National Federation of Fishermen's Organisations
NFU	National Farmers' Union
NGO	Non-governmental Organization
NM	Nautical Miles
NTMPA	No-take Marine Protected Areas
NUTFA	New Under Ten Fishermen's Association
NVZ	Nitrate Vulnerable Zones
NZ	New Zealand
OECD	Organisation for Economic Co-operation and Development
OMSCo	Organic Milk Suppliers Cooperative
PDO	Protected Designation of Origin
PGI	Protected Geographical Indication
PO	Producer Organisations
PPL	Pence Per Litre
RACs	Regional Advisory Committees
RCCC	Cornwall is the Real Cornish Crab Company
RDPE	Rural Development Programme for England
RFS	Responsible Fishing Scheme
RPA	Rural Payment Agency
SACs	Special Areas of Conservation
SFC	Sea Fisheries Committees
SFP	Single Farm Payment
SMP	Skimmed Milk Powder
SPAs	Special Protection Areas
SPS	Single Payment Scheme
SSSI	Sites of Special Scientific Interest
STECF	Scientific and Technical Committee of Fisheries

SWFPO	South Western Fish Producers' Organisation
SWHFA	The South West Handline Fishermen's Association
SWOT	Strengths Weaknesses Opportunities Threats
TACs	Total Allowable Catches
TFCs	Transferable Fisheries Concessions
TFEU	Treaty on the Functioning of the European Union
TSG	Traditional Speciality Guaranteed
UK	United Kingdom
USA	United States of America
WMP	Whole Milk Powder
WTO	World Trade Organisation
YOY	Year On Year

Executive Summary

Introduction

The purpose of this report is to investigate the nature of policy requirements and market imperfections, and their implications for the sustainability and resilience of inshore fishing in the county of Cornwall, England and dairy farming in Somerset, England respectively, as part of the EU-funded Horizon 2020 project, Sufisa (Sustainable finance for sustainable agriculture and fisheries).

Data collection methods

Key to the approach taken has been to put the fishers and farmers themselves at the centre of the research, in order to get their perspectives on the key issues that need to be considered. In the first instance, a media analysis was conducted (which covered national, regional and specialised media from 2005 to 2016), as well as a desk-based analysis of market conditions and regulations (sources reviewed included: academic publications; government and policy documents; market research and consultancy reports; industry reports and NGO documents), supplemented with 30 expert interviews. Following analysis of the resultant data, three focus groups (FGs) were held with fishers at three locations in Cornwall, followed by a workshop composed of Cornwall fishery experts. For the dairy case study, three FGs were held in Somerset with dairy farmers, complemented by 11 supply chain interviews, and followed by a workshop composed of key dairy industry stakeholders (see below for more details on the FGs, interviews and workshops).

Inshore fishing sector, Cornwall

Inshore fishing and the Cornish economy

In 2014, there were an estimated 11,845 fishers in the UK, down 12% since 2004. In the same year, UK vessels landed 756,000 tonnes of sea fish (including shellfish), 60% of which was landed in the UK and 40% abroad, with a total value of £861 million. In 2014, fishing accounted for 4.1 per cent of gross value added for the agriculture, hunting, forestry and fishing sector. The focus of this case study is on inshore boats which are less than 10 m long and which fish out of the U10m pool. They are responsible for relatively small quantities of demersal and pelagic species landings, with around 80% of their catch being shellfish, which typically gain higher than average prices (MMO 2015). Although some issues are common to all fishers within the UK, the inshore fleet faces particular issues, not least in terms of its continued existence and contribution to the socio-economic contexts/communities within which it operates. In this respect, Cornwall represents one of the areas where inshore fishing remains a key part of the rural community, both economically and culturally.

Cornwall forms the westernmost part of the south-west peninsula of the UK, with a population of just over 530,000 people. It is one of the poorest parts of the UK in terms of per capita GDP, with relatively low average earnings and relatively high unemployment. In 2011, Cornwall's wealth was a little over 60% of the EU average per capita. As such, the county is a European Convergence area, meaning that it has access to both ERDF and ESF funds. Key to the

dissemination of European funds in Cornwall is the Cornwall and Isles of Scilly Fisheries Local Action Group (FLAG). The formal aim of the 2012 FLAG was to "maximise the economic opportunities and benefits open to Cornish fishing communities in a sustainable and cooperative environment". In the second round of FLAG, which started in 2016, a key focus is on innovation and adding value to the fish caught, not least in response to the landing obligation (see below), as well as to maximise the tourist £.

Tourism is the most important industry in Cornwall, representing about 25% of the county's GDP, with 4.5 million visitors to the county every year. The presence of a fishing industry is an important part of the tourism appeal of Cornish coastal towns. As such, the continuation of the fishing industry within Cornwall is important to the county's future prosperity. There are over 600 registered fishing vessels in Cornwall, of which almost 90% are U10m in length. It is estimated that the Cornish fishing industry employs approximately 3300 people, based on 900 active fishermen, plus an estimated 2.75 jobs on shore for every fisherman. When tourist jobs created as the direct result of fishing are also considered, it is suggested that the multiplier is 4:1 (Morrissey and O'Donoghue 2012).

Policy and regulatory conditions

Collectively, fishers benefit from policies that rule the fleets' capacity: the number of vessels, gross tonnage and engine power (hence the licenses for approved vessels to fish); as well as the management of the natural resource (hence total allowable catches, quotas, the management of time spent at sea, and other technical measures). However, the combination of restrictive licensing, individual vessel quotas, days at sea allocation and catch composition rules significantly reduce the flexibility of fishing operations that might otherwise enable individual fishers to adapt to changing conditions. Decisions on what, where, when and how to fish are now very tightly circumscribed, affecting both short-term and longer-term business planning (Symes *et al.* 2015).

The Common Fisheries Policy (CFP) sets out the overarching regulatory conditions for all fishers within the EU. First implemented in 1983, it has subsequently been reformed three times: in 1992, 2002 and 2013. The main challenge for the CFP is to manage a highly heterogeneous fisheries sector, and to design optimal policies for multi-ecosystems, multi-species and multi-fleet fisheries (Frost and Andersen 2006).

In the run-up to the 2013 reforms, Greenpeace and NUTFA (New Under Ten Fishermen's Association), amongst others, produced a 'manifesto for fairer fisheries'. It emphasised the importance and value of inshore fishing, as well as highlighting that the majority of quota (effectively, the right to fish) has been targeted at large-scale fishing operations. In terms of numbers, the inshore sector in the UK comprises nearly 80% of the boats, yet receives only around 8% of the annual quota (MMO 2015). Arguably, therefore, in order to reflect the different orientation between the two fisher groups, there should be different management regimes for large-scale fisheries and small-scale fisheries, with the former focused on economic efficiency, while the latter focuses more on social objectives (Urquhart *et al.* 2011). Indeed, Phillipson and Symes (2015, p. 344) argue that "the European Commission has never been comfortable in its handling of socioeconomic issues in fisheries", with the main focus of both

research and policy being on the biological and economic aspects of fishing, with scant attention paid to the social and cultural impacts of the pressures faced by fishers.

In 1983, as part of the CFP, a system of allocating Total Allowable Catches (TACs) for each EU Member State (MS) was introduced, as a means of conserving fish stocks and sharing access to EU fisheries resources between member states. The TAC is set each year by the Council of Fisheries Ministers following negotiations on catch options that are provided by the Advisory Committee (ACOM) of the International Council for the Exploration of the Sea (ICES). Once a TAC is agreed for each stock and fishing area, it is allocated as national quotas to MSs in accordance with fixed percentages based on historic fishing rights. The MSs are responsible for ensuring quotas are not overfished. When the entire quota is fished, the fishery has to close. It is clear that some MS have greater influence than others in the decision making process. Greater transparency is required to determine what takes place during the closed door negotiations at the Council of Fisheries Ministers (Carpenter *et al.* 2016). Anecdotally, many of those involved in fishing in Cornwall are concerned that the science is always behind the reality, in that fish stocks fluctuate dramatically from season to season.

In the UK, management of quota for the over 10 m offshore vessels has been largely devolved to Fisheries Producer Organisations (FPOs). However, for vessels U10 m there is a single block of quota allocation that reflects the aggregated activity of that part of the fleet during a 1994 to 1996 reference period. For the most part, allocation of quotas for the inshore fishing fleet is managed directly by the national fisheries administration (Defra in the UK) and specifically its appointed agency, the Marine Management Organisation (MMO) (Le Floc'h *et al.* 2015), rather than the POs. The MMO set monthly catch limits for each quota species (which can vary significantly throughout the year). Having monthly catch limits means that in 'good' months a vessel's catch may be restricted, leading to the possibility of discards; it also means that vessels are unable to make up for any 'bad months' where catches of a particular species are lower than the allocated quota. At present, the higher catching U10m vessels often lease quota at the start of the year in case they land a valuable catch which would cause them to exceed their monthly catch limit (Defra 2014). This quota is leased from the over 10 m sector quota allocation, in that the U10 m quota is non-tradable. There is no quota on crab or lobster at present, both of which are very important to the inshore fishing industry in Cornwall; nor are there any other restrictions apart from minimum landing sizes and the need to have a permit. However, there are concerns that more and more pots are being set out, potentially impacting the sustainability of this part of the fisheries sector.

Another issue in relation to the management of quota, is that it has evolved from one where quotas were effectively community / state owned to one of privately owned individual quota rights (i.e. the privatisation of a state resource), where quota is freely tradable. As fishermen retire or otherwise exit the industry, quotas are sold and increasingly the highest bidders are larger companies outside Cornwall. This trend reduces the availability of quota left to the existing Cornish fleet, making it almost impossible for new entrants to join the industry. Access to additional quota for the U10 m boats is particularly problematic, in that it is often sold in lots that are too expensive for small boats.

A further issue in relation to quota is 'latent capacity'. At the beginning of March 2016, the MMO sent out letters to all under 10 m vessel owners that did not have a history of catching a

particular species in a recent three year reference period (2010-2013). If their licence allowed for them to catch a particular species and yet none of these fish were caught during this reference period, then their licences were capped and they would no longer be able to catch this species. The license for this will then be transferred to other boats within the under 10 m sector. The MMO perspective is that there is quota available which is not being utilised (known as 'latent capacity'); from the perspective of the smaller fishers it reduces their flexibility in terms of what they can catch and when. In practice, very few fishers have had their licences capped, in part due to the appeals procedure that is available.

The discarding of fish is a widespread problem in EU fisheries, resulting from a number of interrelated issues. In order to reduce waste, and pushed by public opinion, the EU is in the process of implementing a discard ban by introducing an obligation to land all catches. This obligation is gradually being introduced on a fisheries-by-fisheries basis between 1st January 2015 and 1st January 2019. The phased implementation is to allow time for fishermen to adapt their fishing practices. At the time of this research, the implications of the discard ban had not really been experienced by those involved. A key concern, however, was in relation to 'choke' species. This can happen where a fisher has fully caught their quota for one species before catching all their allocated quota for another species in the same sea area. If this happens, then the vessel concerned will have to stop fishing in that sea area due to the fact that they cannot guarantee avoiding the species for which they have no quota left. The species that they have run out of quota for is known as a 'choke species'.

There is a widespread perception that fisheries management in the EU, via the CFP, has failed to deliver sustainable fisheries and economic vitality, with one of the generally accepted reasons for this being a lack of transparency and the failure to include a wide range of stakeholders and perspectives. A key impetus for change within the UK was the Defra publication *Safeguarding our Seas* (2002), which resulted in the Marine and Coastal Access Act 2009 (MCAA). Under this Act, the UK Government is committed to implementing a network of Marine Protected Areas (MPAs), which are to be developed via a stakeholder participation process that entails the collaboration of scientists, fishermen and conservationists (Seafish 2013). The MCAA also resulted in the formation, in April 2011, of 10 Inshore Fisheries Conservation Authorities (IFCAs) to replace the existing 12 Sea Fisheries Committees (SFC). Membership of the IFCAs is more inclusive than the previous SFCs, with the aim of developing a more open and inclusive governance model that can deliver sustainable fisheries and help instil a sense of trust and legitimacy. Nevertheless, despite this inclusive approach, there are clearly tensions between conservation and fishing.

Markets and marketing

It is critical to note that the economic and market performance of the fisheries sector is not only important to the fishers themselves, but also to the wider communities in which they operate. It has been estimated, for example, that every fisher at sea creates a further four jobs on land. These jobs include processing, transportation and perhaps most critically, tourist jobs. In other words, the fishing economy at a local level involves more than simply the value of fish caught (Morrissey and O'Donoghue 2012).

Reed *et al.* (2011, p. 4) suggest that inshore fishermen have three principal routes to market: fish merchants, who then take it to the end user/consumer; selling at harbour side auctions; and (less usually) selling direct into the hospitality trade. Access to the multiple retailers is effectively impossible for small scale inshore fishers, in that these retailers almost exclusively use supply chains covered by various (usually expensive) certification processes (often MSC – see below). The FLAG in Cornwall has had a part to play in developing the local fishing sector in coordination with the wider food economy, not least by making investments to improve the quality/qualities of locally caught fish, and to give it a 'story' that is associated with traceability and sustainable fishing practices. However, while diversifying market outlets in this way may help to develop resilience for fishers, it also requires additional knowledge, investment and competence (Doeksen and Symes 2015).

The most important market outlet for Cornwall fishers is harbour markets, which include Newlyn, Looe and Plymouth. Significantly, approaching 80% of the fish landed in Cornwall are exported, in many cases to France and Spain in Vivier lorries that are able to carry live crab and lobsters, with little value added locally, although this is starting to change. A key issue in developing the (domestic) markets for fish in the UK is to educate the British public about eating a wider variety of fish species. This led one interviewee to suggest that: “A huge amount of fishing economics is around the marketability of the product, rather than the catchability of the species”.

Many observers feel that, especially smaller scale fishers, must add value to their catch if they are to survive. The smaller day boats turn over perhaps £200-£400 in a day, however it is difficult to be certain how many days a year it will be possible for them to go out (due to bad weather, choke species, a lack of quota etc.); as such, they need to develop a greater sense of entrepreneurialism and to actively develop their own markets. For many fishermen, selling their fish at harbour-side is all they really consider in terms of markets, judging that they do not really have the time to go and market the fish themselves, preferring instead to focus their energy on catching the fish in the first place. Nevertheless, there is evidence that more and more fishers are seeking to access Cornwall's local markets, which is helped by the Cornwall Good Seafood Guide that provides an information portal for those interested in buying Cornish seafood. There is also increasing evidence of fishers using social media to make direct contact with buyers and to cut out the middleman, with some now selling direct to buyers in London. Selling to London (and indeed other large cities) has the potential to realise considerably greater prices for the fish sold, in that London-based restaurants and fishmongers have more buying power than their Cornish equivalents.

There is some debate about the value of certification schemes for inshore fishers. At one level, in order to put fish that have been caught on the market, both the EU and national governments require some minimum safety standards. In this respect, public standards are increasingly being supplemented by private safety and traceability standards from corporate retailers. Two of the largest fisheries certification schemes are Friend of the Sea (FoS) and the Marine Stewardship Council (MSC), covering about 18% of global sea fisheries production. Yet in economic terms the benefits of certification remain uncertain. From the point of view of retailers they can result in price premiums and increased consumer trust, but for fishers it seems that the only benefit is access to certain supply chains, without necessarily obtaining significant price premiums on the catches concerned (Bellmann *et al.* 2016). Having said that, certification may be important for

processors to gain access to certain market outlets, which inevitably has a knock-on effect in terms of the prices they can pay to the fishers themselves.

Resilience

Understanding the potential for resilience amongst inshore fishers is a key outcome of this case study. Tendall *et al.* (2015, p. 18) argue that “resilience implies the capacity to continue providing a function overtime despite disturbances... thus form[ing] an essential part of what enables sustainability”. Over recent decades, the long-term sustainability of many smaller fishing communities has come under pressure, leading to the loss of basic local services, a lack of affordable housing, and difficulties in recruiting crew members as young people are unwilling or unable to go into fishing (Symes and Phillipson 2009). Individual fishers and their families often struggle for regular income, in that they face a range of risks and uncertainties, many of which are beyond their direct control, including seasonality, severe weather, market instability and variability in terms of fish stocks.

The risks faced by fishers have been compounded by management restrictions imposed through the CFP. In this respect, policy-making is often associated with being ‘top-down, distant, centralised and lacking local specificity’, thereby alienating many inshore fishing communities who tend to be suspicious of ‘policy’ and ‘science’, which are perceived as external or outside interference. Flexibility is seen as a key attribute of fishing sustainably and regulation is seen as “reducing the scope for fishermen to practice many of the attributes associated with being a good skipper, such as using local ecological knowledge to determine what to fish” (Ross 2015, p. 319). Flexibility also involves internalising costs, to engage in pluriactivity, to embrace the ethos of self-employment, and to reduce crew size. Through these measures, small-scale inshore fishers and their households have shown remarkable levels of resilience and the ability to adapt to changing circumstances, with research suggesting that it is only as a last resort that fishers will exit the industry (Coulthard and Britton 2015).

Intergenerational continuity is a key issue when addressing the sustainability and resilience of inshore fishing across Europe. Traditionally, many fishers came through the hereditary pathway. However, fishing is no longer seen as the occupation that it once was in terms of status, financial rewards or job security. There is no longer the same pressure within families to persuade sons to follow their fathers, with the result that aspiring fishers increasingly come from outside the fishing community. This creates an additional problem for aspiring fishers, both in terms of finding the necessary finance to purchase a boat and license, but also in terms of gaining experience through working on boats and ‘learning the ropes’. Working as crew is now less common, as many inshore fishers have adapted their boats to enable them to fish single-handedly in order to reduce crew costs and improve their profitability. The result is that aspiring fishers must increasingly look to buy their own boat, which involves considerable investment in terms of the vessel itself, fishing gear and a fishing license. This is leading to an ever increasing average age of fishers, with less than 20% being under the age of 30 and the average age approaching 60 (White 2015). Looking to the future of inshore fishing in Cornwall, there are clearly concerns that the sector is under pressure:

"I can see the smaller harbours not having boats working for them... So I can see some of the smaller places becoming just tourist harbours... I can't see that being reversed unless there is some sort of change in policy to support small-scale fisheries" (Interviewee 1).

Focus groups and workshop feedback: drivers, strategies and future performance

A series of *three focus groups* (FGs) were held with Cornish inshore fishers over the period December 2016 and January 2017, in order to provide an insight into their perspective on the issues they face. A *workshop* with key stakeholders involved in the inshore fishing sector was subsequently conducted in March 2017, following reflection on the FG data, with two main aims. Firstly, to 'ground truth' the findings of the research to date; and secondly, to develop a range of scenarios regarding the future viability of the inshore fisheries sector in Cornwall, which are inevitably linked to the Brexit negotiations. Analysis of the data revealed that there were six key areas that required further examination, each of which is now taken in turn.

First. Reasons for going fishing.

Discussions at the FGs revealed that fishers are passionate about what they do and do not want to do anything else. This is significant, in that they are likely to carry on fishing until the bitter end, enduring difficulties that those involved in other livelihoods might find too much. In this sense, they are innately highly resilient.

Second. What is distinctive about inshore fishing

Firstly, that they are highly localised, tending to fish within 6nm of the coastline (notwithstanding that those with a larger engine/deck size may venture further out). Because they are restricted to a relatively confined geographical area, the smaller inshore boats are effectively embedded in their local environment, giving them an incentive to look after the fishing grounds in their immediate area. This sentiment was sometimes expressed in relation to larger, more nomadic fleets of boats which may have less connection with, and incentive to look after, their local area/fishing grounds.

Secondly, due to the fact that they are highly localised and are relatively small-scale in terms of their operations, the fishers feel that they are inherently ecologically sustainable. In this respect, they are restricted in terms of the distance they can travel from their home port, as well as in terms of the fishing gear they can carry; furthermore, in most cases their gear is static gear. This perspective is encapsulated in the following:

"I mean, we're under 10 m boats, we've got a limited distance, a limit to what we can carry, gear-wise and catch-wise. Why not say catch whatever you want, your impact on the overall fish stocks is going to be minimal... If we ruin our own ground, then we're all out of a job" (Padstow FG).

However, for these distinctions to hold good, there is a need to consider re-categorising what is meant by inshore fishing. At one level inshore fishing boats can be categorised as those under 10 m and fishing out of the common pool managed by the MMO; yet this is only part of the story. In general, the inshore fleet will fish within 6nm of the shore, although some of the more powerful vessels may go out further than that; there is also clearly an issue with what are known as 'rule beaters'. The latter are boats that have been specifically designed to be under 10 m in order to benefit from fishing as inshore vessels, and in many cases has involved cutting down larger vessels to 9.9 m in length. While the difference between a 6.5 m and 10 m boat may not sound that significant, it needs to be thought of in terms of the cubic relationship, with the 'rule beater' boats often having very much larger deck spaces and engines which allows them to carry much more gear. The result is that although they may be under 10 m in length, "they've

effectively got the capacity of a 15 or 20 m boat" (Padstow FG), negating the benefits outlined above. The result is that U10 m boats vary enormously in terms of the value of fish they land. At one end of the spectrum it might be as little as £15,000 a year, whereas others might gross up to £200,000. The idea of re-categorisation resulted in considerable debate in the workshop, whereby it seems that any re-definition will need to encompass geographical distance, size of the boat and the type of gear used. In this respect, the 6nm limit is likely to be significant in demarking what might be understood as the inshore sector.

Third. *Markets, marketing and institutional arrangements*

In relation to markets and marketing, *adding value* was the most critical issue discussed, inextricably linked with the quality of the fish being sold. In this respect, the catch of inshore fishers was recognised as having the potential to be of the very highest quality available (in that it is usually landed on a daily basis), although this necessitates that the fishers involved look after their fish. Linked with 'looking after your fish' is the establishment of a reputation for providing quality fish, as well as the development of personal relationships with individual buyers, such as head chefs or fish merchants. This is recognised as enabling better prices, although it is "very hard to get yourself a good name, but very easy to get yourself a bad name" (Helston FG).

The majority of fin fish landed in Cornwall goes to the harbour markets in Newlyn, Brixham, Plymouth and Looe, whereas Crustacean and Mollusca go either to processors or more usually are sold abroad (mainly to France and Spain) via Vivier lorries. Overall, approximately 80% of the fish caught in Cornwall are exported. There was a strong sense amongst fishers at the FGs that you have to have a strategy in terms of marketing your fish: "otherwise you are at the mercy of what the buyer is going to give you" (Newlyn FG). In this respect, that a degree of entrepreneurship is critical and it is no longer enough to be simply good at catching fish.

A number of fishermen sell their produce to restaurants or dealers in London, such as Dreckly Fish and Kernow Sashimi. In taking this approach, it is possible to get a very considerable mark-up over local market prices, perhaps in the order of 300-400%. Yet, at the same time this requires considerable extra work and know how, which many fishermen are not prepared to do, preferring instead simply to catch fish. For example, developing Dreckly Fish involved travelling to London to make face-to-face contact with potential customers, as well as continuing to develop those personal relationships (based on trust and continued quality) over time.

Selling to local restaurants is another market avenue that adds considerable value to the catch. In order to do this, it is important to develop a good relationship with the head chef, to the extent of calling them every day to tell them about the catch that is available. In this respect, Cornwall is luckier than most in that there are a number of high-end restaurants and foodie hotspots, such as Padstow. However, it was pointed out in both the FGs and the workshop that in the UK, and even in Cornwall, fish is generally speaking not part of our culinary culture (unlike France for example). There is scope therefore to encourage domestic demand with the right incentives and policy initiatives.

In terms of developing new *institutional arrangements* (IAs), it is apparent that there is minimal horizontal coordination between the inshore fishers. Indeed, findings from the focus groups suggest that in most cases fishers are highly independent, and indeed secretive, both in terms of what they catch, but also where they sell it and for how much. Where coordination does take

place, it is likely to be within families. Similarly, in terms of vertical coordination where, despite some evidence of fishers working with local processors (such as Kernow Sashimi), most of the inshore fishers in Cornwall sell their catch directly through the harbour markets. In terms of policy incentives to change how fishers sell their catch, the local FLAG have provided both advice and money, although a key finding of this research is that fishers need to be encouraged to be more entrepreneurial.

Fourth. *Quota.*

In all three FGs, discussions around quota were the most vibrant and heated, with access to sufficient quota being the single biggest issue, often related to the CFP and the opportunities presented by Brexit. There was a strong feeling that there are plenty of fish around and it is just a matter of allocating them more fairly and re-visiting historic 'grandfather rights' and Relative Stability. There were also concerns that the quota system is not managed properly in terms of determining what an appropriate quota is. Likewise, in terms of the "disproportionate allocation between the over 10s and the under 10s", whereby "94% of the quota goes to the over 10s and a measly 6% is shared out between the mass of the boats" (Helford FG). There was also frustration that the U10m boats are only allocated their quota on a monthly basis, rather than on an annual basis which would give them much greater flexibility.

The monetisation of licenses and quota was another issue raised in the FGs, as well as the workshop. Originally, both licences and quota were distributed by the UK Government for nothing, but now you have to buy them and there are brokers who sell both licences and quota. U 10 m boats are unable to own quota, which is allocated to them from the U 10m pool by the MMO, but the monetisation of licences creates a considerable cost barrier to those wishing to get into fishing. "There's no value to a licence, but I can't go to sea without a licence and I've got to buy a licence of about £280 per kilowatt... You're talking £10,000 plus for a little boat like mine to have a licence, it's ridiculous" (Padstow FG). Related to the cost of licenses, is the notion of 'latent capacity', as discussed above. Where a licence is capped, then its value is hugely reduced. It effectively devalues the boat as well, in that the license is tied to the boat. It also removes a degree of flexibility, as some of the boats clearly like to focus on one particular stock -- such as lobster -- but keep others in reserve.

Fifth. *Policy, management and representation.*

The key issue discussed in relation to policy and management was that legislation and bureaucratic necessities need to be better tailored to the needs of smaller boats, as captured in the following:

"One of the main factors in Cornwall is that it's such a mixed fishery in terms of things turning up and things being available to fishermen... What fishermen want to be able to do inshore is take advantage of these opportunities and to be versatile; that's the absolute key to inshore fisheries being successful. There's such diversity of fishing types that trying to find one rule that fits everybody is incredibly difficult. I mean days at sea would be ideal for some people, but it could crucify somebody else" (WSP 1).

There are also concerns that the 'voice' of inshore fishers is not being sufficiently heard and that their access to policymakers is restricted. Even though there is nominal representation on the IFCA, other lobbies are felt to have more sway. Similarly, with the Cornish Fish Producers Organisation (CFPO), which has 200 members (80 of which are inshore fishers) and the potential

to be a significant lobby force. Nevertheless, there was a strong perception amongst the FG attendees that the CFPO is predominantly concerned with the interests of the larger scale fishermen: "They should take under 10s into consideration, but they don't at the minute" (Newlyn FG). This perception was endorsed in the *workshop*, where it was discussed that the PO exists principally to manage quotas and that they don't do much for the inshore fishing sector. Of particular concern to the fishers is representation at the forthcoming Brexit meetings: "These big players, like CFPO the other North Eastern POs, they are going to be around the table and we don't have any representation, it's hopeless, we have no salt in the river" (Helston FG). Partly as a response to this feeling of under-representation, one of the FG attendees had visited Defra to attend the inaugural meeting of a new coastal PO whose remit is to support the interests of the inshore fishing sector across the UK. This was felt by those at the FG to be an important step forward, especially in relation to the allocation of quota to the U10m sector.

Sixth, resilience, succession and the future

The innate passion of fishers means that they are likely to be inherently highly resilient and to continue in fishing beyond the time that makes economic sense. In order to do this, they exhibit a range of different adaptive capacities, such as: carrying extra gear and leaving it to lie for an extra day (which means that there is even more gear on the ground, adding to the pressure on particular fisheries); putting more and more pots down (which requires more investment and adds to the pressure on stocks); going further out to sea (which is inherently more risky); fishing single-handed (which reduces the opportunities for new/young fishers to gain experience); adding value and developing their markets (which requires new skills and perhaps additional investment, such as in IT equipment) and so on.

Although there was optimism about those currently fishing, remaining in fishing, people were much less sanguine about the ability of future generations to get into fishing:

"The people that are in the game, who have been in it for many years are resilient and will probably see it through to retirement. But when it comes to succession... I think we are going to see some ports peter out to nothing. In the future, it's hard to see what will attract enough people. It's never going to be making your fortune – it's a lifestyle choice and it's probably not as popular a lifestyle choice as it was" (WSP 2).

In this respect, cost and opportunity were seen as the two main constraints. Cost in terms of the boat itself, but also the licence and gear, including the monetisation of licences. "When we left school, you could go and buy a boat... The licence didn't have a value... Now if you bought a boat for 10 grand, your licence would be 10 or 15 grand on top of it and then the same again for gear... So the youngster hasn't got a hope in hell" (Helston FG). There were also concerns in relation to opportunities, in that there is an increasing tendency for inshore fishermen to go single-handed in order to remain viable, which has reduced the opportunities for potential fishermen to get into the industry as crew.

Looking to the future, fishers are not looking for handouts, such as being paid for creating community or for public good services, but what they do want is: "better legislation, less bureaucracy and more quota" (Helston FG). In other words, there is a strong feeling that the U10m boats need to have legislation and management that is more specifically tailored to their needs.

The future: Brexit and beyond

Any discussions about the future of fishing in the UK inevitably involve looking at what the Brexit negotiations will result in. As such, Brexit was discussed at length in both the FGs and the workshop. Two of the workshop participants, in particular, were adamant that the CFP was not fit for purpose and that Brexit offered the opportunity for change: "We need suitable management through fisheries legislation which we haven't got at the moment". Likewise in the FGs, Brexit was often mentioned as being pivotal to the future of the inshore fishing sector in Cornwall, as well as the fishing sector more generally.

"This is British fishing's main chance it will ever have. If the Government cock this up we'll never have a chance like it again. We've got to get EU boats out of our waters. We've got to try and take back control of the quota" (Newlyn FG).

Apart from access to more quota, the key issue discussed was to try and extend the limit of waters that are exclusive to UK fishermen. At the moment, EU vessels with 'grandfather rights' are able to fish within the 6-12 nm range (in Cornwall this is mainly French and Belgian boats), with many of the participants arguing that the whole notion should be revisited, including that the rights should cease once a boat is sold. The main reason for pushing for this change, especially from an 'inshore boat that lays pots' perspective, is that any pots they lay between 6 and 12 nm are in danger of being towed out by the trawlers (although not explicitly acknowledged in the FGs, there are also UK-based trawlers fishing in this area). Over the years, many of the fishers have lost hundreds, if not thousands, of pounds worth of gear to this process. As a result, in order to try and reduce this risk, many of the fishers have decided not to lay their pots beyond the 6 nm limit. It was argued that extending the limit to 12 nm would help space out where the pots are placed, because at present they are effectively squeezed into the 6 nm zone. "Opening up to the 12 mile and pushing the foreign boats outside into international waters, would free up everybody's fishery here" (Padstow FG). In the workshop it was suggested that in terms of negotiation, the UK should start by demanding that the UK reclaim its 200 mile EEZ, but more realistically aim to end up with the 12 nm limit.

When asked what would be the impact on the inshore fishing sector in Cornwall should the UK Government fail to get the 12 nm limit imposed, the response was: "Disastrous really: we've got to get that 6 miles back. *So from the point of view of the inshore sector it could make the difference between surviving in perpetuity and actually going out of business when this generation of fishers dies off?*" A statement that was greeted with a chorus of 'yes!'. In this respect, there was a general sense that things are not going to get any worse post-Brexit in relation to the inshore fishing sector, and hopefully will get better.

Whatever happens in terms of the negotiations, several of the participants emphasised the importance of having accurate science in terms of fish stocks, otherwise it becomes impossible to determine whether something is sustainable or not. In this respect, there was recognition that there will still need to be coordination with those countries fishing under the CFP, or there is a danger that there will be overfishing. This will require negotiation between the UK and the EU in terms of what the stocks of a particular species are, as defined by ICES, notwithstanding that the advice they give is invariably watered down by political processes. In this respect, that there are two separate issues at play in the Brexit negotiations: one is the right to fish within a particular area in the sea; the other is the right to catch a share of the fish available in that area.

In other words, fishers may have access to fishing grounds, but they may not have quota to catch the fish once they get there.

Despite a general sense of optimism (or at least hope) that Brexit will result in positive change for the inshore fishing sector, there was also concern expressed at the Helston FG, in particular, about the dangers of the Brexit negotiations, especially in relation to the export markets for fish. For example, that the EU may impose significant tariffs on UK exports of fish, or perhaps even withhold access to certain markets. This could be devastating, in that between 80-85% of fish caught in Cornwall is sold to Europe. Similarly, instinctive enthusiasm for Brexit was tempered by a concern that nothing much will change in reality, not least because fishers are unconvinced that the UK Government will fight their corner. “Our Government doesn’t really seem to give two hoots about the fishing industry. I think we will be used as a bargaining chip for something else, like farming” (Padstow café).

Whatever the nature of the Brexit negotiations, there was a perception that change is going to take time, perhaps as long as 10 years, not least because government departments in general, and Defra in particular, have faced considerable cuts over recent years and are short of staff. This perception is captured in the following quote from the workshop: “I think there’s going to be so much chaos in the next 5 years. I think the negotiations over quota will be hostile and ongoing for the first few years and we’ll be desperately trying to write our own legislation. We will have copy and pasted it by then, but I think we will be looking to change certain parts, but it won’t have changed fast enough for the industry and they will be unhappy that change has not been delivered. I think in 10 years’ time things will take shape again and markets would have balanced themselves out again. But 5 years’ time, I don’t think it will be a good place.”

A key aim of the workshop was to develop a range of scenarios regarding the future viability of the inshore fishing sector in Cornwall, from the discussion outlined above. In this respect, the idea of transition is central: transition in a temporal sense, but also in terms of what is negotiated. There is an ‘ideal’ starting position (likely, perhaps to be the UK’s EEZ or Median Line), which will be the subject of a hard negotiation, ending up with something that is more, or less, acceptable. On this basis, it is possible to suggest three scenarios for the inshore fishing sector in Cornwall.

However, before doing so, it is imperative to consider a number of over-arching factors. *First*, the voice of the sector is in danger of not being heard by those making the decisions regarding the future of the fishing industry. *Second*, that the definition of an ‘inshore fishing sector’ is insufficiently precise and in need of refinement. *Third*, it is important in policy terms to be clear as to the purpose of the inshore sector (howsoever the sector is defined). Is it about catching fish or preserving a way of life; making a meaningful contribution to food and nutrition security, or simply providing a luxury product; or primarily in terms of its socio-economic contribution to rural communities? *Fourth*, how best to deal with the monetisation of licences and quota. In both cases, neither had any monetary value when originally issued, but due to their limited availability have been increasingly traded between fishers. One option is for the UK Government to buy back this quota and to allocate it to fishers as they see fit. Inevitably this would be very expensive, but would allow for a different and more policy-targeted approach to be taken in terms of quota allocation. *Fifth*, the timescale involved for any of the possible scenarios to come to fruition may be as long as 10 years. *Sixth*, the fisheries sector as a whole is very small in terms

of its contribution to the overall GDP of the UK, with the inshore sector only contributing a very small percentage of that. As such, there are concerns that it may be used as a bargaining chip in the wider Brexit negotiations and effectively become marginalised. Bearing these caveats in mind, the three scenarios were developed as follows:

Scenario 1: Retention of the Status Quo.

Following the Brexit negotiations:

1. access to fishing areas and the allocation of quota will remain broadly in line with the current arrangements under the CFP;
2. access to the EU's markets will remain unchanged and no tariffs will be introduced;
3. management of the UK's fisheries will continue to be through negotiations with EU members in Brussels, rather than at a national or local level;
4. existing EU environmental designations will be incorporated into UK legislation.

Predicted impact on the inshore fishing sector in Cornwall:

1. insufficient quota to allow many of them to survive, economically;
2. often inappropriate and burdensome legislation;
3. insufficient opportunities for successors;
4. the decline of the inshore fishing sector in Cornwall.

Scenario 2: UK regains control of its waters to 12 nm

Following the Brexit negotiations:

1. the London Convention 1964 will be repealed, ending Relative Stability and 'grandfather rights';
2. access to non UK boats will be restricted to beyond 12 nm;
3. more quota is reserved for UK boats, including for inshore boats;
4. the EU imposes tariffs of 5-10% on all fish imports from the UK.

Predicted impact on the inshore fishing sector in Cornwall:

1. able to extend their fishing out to 12 nm with less fear of damage to their gear;
2. reduces the pressure on inshore stocks - especially beneficial to pot fishermen;
3. more quota is available to inshore fishers than at present, reducing the impact of 'choke' species and improving their economic viability;
4. a 5-10% tariff is balanced by the fall in the value of the £ relative to the €;
5. EU market demand continues, but more incentive to develop domestic markets;
6. succession opportunities improve and the decline in inshore fisher numbers is halted.

Scenario 3: UK regains control of its EEZ/median line

Following the Brexit negotiations:

1. the London Convention 1964 will be repealed, ending Relative Stability and 'grandfather rights';
2. the UK will take back control of its 200 nm EEZ, or the median line;
3. UK fishing will be based on the United Nations Convention on the Law of the Sea;
4. the EU imposes tariffs of 30-35% on all fish imports from the UK**;
5. access to EU waters for UK boats is strictly curtailed.

Predicted impact on the inshore fishing sector in Cornwall:

1. marine planning of all UK waters is completely under control of the UK authorities;
2. legislation can be better tailored to local conditions;
3. a greater share of the quota allocated goes to the inshore sector, reducing the impact of 'choke' species and improving their economic viability;
4. EU markets demand for their catch is reduced by 30%, meaning that it is imperative to develop more local markets;
5. restricted access to EU waters will not affect the inshore sector;
6. greater opportunities and optimism for the future of the sector, including succession.

** If this were to be the case, then tariffs would be set to WTO levels. These operate on a sliding scale, with processed fish having tariffs in the order of 25% and raw fish being lower than this.

Presentation of the project's findings to DEFRA

Although the Sufisa project has been financed by the European commission, and it is to the Commission that the results of the research should be reported, it was felt important to also present the results to the UK's government department responsible for fisheries - Defra (Department for the Environment Food and Rural Affairs) – not least due to the forthcoming Brexit negotiations. A meeting was arranged for 10th May 2017 at Defra's offices in London. Some of the key messages presented by the research team, included:

- The inshore sector is desperate for more quota and there are concerns about the introduction of licence capping.
- There is a need to consider buying out licences and quota that have been increasingly traded over recent years, so that they can then be re-distributed by the state.
- Fishers see Brexit as an opportunity for change, but are sceptical that the UK Government will argue the fisheries' position strongly enough in the Brexit negotiations.
- The research team presented that the feeling from the FGs and workshop was that the UK's starting position in the Brexit negotiations should be to get the EEZ back and to hopefully end up with the 12 nm zone returned to UK control.
- It was acknowledged by Defra that it would be critical to review, and perhaps repeal, the London Fisheries Convention, in that this convention enshrines the notion of 'relative stability' and hence historic fishing rights.
- The need to give voice to the inshore fishers, not least because neither Fishing for Leave nor the CFPO do this sufficiently well. In this respect, that there was support at the local level for the development of a Coastal PO.
- Frustration that much of the regulation developed at the Commission is not necessarily appropriate at a local level, especially in Cornwall where there is such a diverse fishery.

In this respect, that 'one size does not fit all' and that there is a need for more appropriate bottom-up regulation that has been developed at a local level.

- Concern about the potential loss of EU markets. Related to this, there is recognition that fishers need to become more entrepreneurial in terms of how they market their catch, and that perhaps there is a need to support this through both policy and monetary support.
- While the inshore fishing sector may be marginal in economic terms, it is of critical value to the wider economy in Cornwall, especially tourism, as well as to the social fabric of many of the communities involved. In this regard, it was discussed that it would be of value to conduct an SROI (Social Return on Investment) on the inshore fishing sector in Cornwall. This would then provide a clearer idea as to the wider benefits of the inshore sector, expressed in monetary terms.
- Ultimately, if change along the lines suggested above does not come about to some extent, the research team made the point that the future of the inshore fishing sector in Cornwall does not look bright, especially after the current generation of fishers die off. In this respect, that existing fishers are inherently highly resilient, but that fishing as a vocation/job has much less appeal these days, as well as providing fewer opportunities than it did a generation ago.

Dairy producers in Somerset

Context: dairy restructuring and dairy farming in Somerset

The UK is the third-largest milk producer in the EU after Germany and France, and the tenth-largest producer in the world (Bates 2016). The dairy sector accounts for about 18% of the UK's total agricultural output. In the last ten years the number of dairy farms has declined at an average rate of 4% per year. There is a concentration of dairy farms in the mid-west and western regions of England, although even these established dairying areas have experienced a decrease in the total number of dairy farms. The pattern of structural change on UK dairy farms is thus towards fewer, larger farms, a pattern which has been well-observed throughout developed market economies.

Various studies have been commissioned to examine the factors driving structural change in the UK dairy sector (e.g. DairyCo 2013), which are usually clustered into two main categories: 'social' (e.g. lack of succession, age of the farmer, education) and 'economic' (profit, cost of production, milk price). Poor milk price is the most significant factor. The milk market, particularly liquid milk, is dominated by supermarkets through which as much as 80% of milk produced is sold. In 2014/2015 dairy farms in the UK had an average Farm Business Income (FBI) of £83,904, which is 4.2% lower than the previous year (McHoul *et al.* 2016). In 2015, there was a SOS Dairy Campaign and a number of well-publicised farmer protests at leading supermarkets and processors. Farmers argued that the price they were receiving for their milk was not sufficient to cover production costs. Milk prices in 2017 have significantly improved, but this may not last and the key challenge is how farmers deal with price volatility, particularly when prices are very low. The impact and strategies available to manage price volatility will vary too depending on the type of dairy farm, which in the UK range from small scale, family, extensive units where animals are exclusively grazed, to units where cows are housed and fed for the duration of their lactation (Dairy UK 2013).

The case study sought to better understand key market and regulatory conditions that potentially impact dairy businesses, including price volatility, and the key strategies emerging to manage these risks. Somerset was selected as a case study area. Somerset is a rural county located in south-west England with a strong tradition of agriculture, especially dairy and livestock farming. Dairy farms account for about 12% of Somerset's farms. The number of dairy farms has remained concentrated over time, although the sector locally has seen some exiting the sector. Herd size numbers in the county have increased, but the county retains a profile of mostly smaller-scale, family run dairy farms. Somerset is also home to a number of large processors and high-quality dairy industries, including Dairy Crest, Müller Wiseman Dairies, Wykes, Barber's, and Yeo Valley Organic. Among Somerset's traditional dairy products, West Country Farmhouse Cheddar was awarded a Protected Designation of Origin (PDO) label in 1996.

Policy and regulatory conditions

The Common Agricultural Policy (CAP) has played a fundamental role in shaping UK agriculture and regulation of the dairy sector since the UK joined the then European Economic Community in 1973. The key policy changes that have had an influence on the UK dairy sector are: the introduction of milk quotas in 1984; the 1992 CAP Reform and farmers' payments for ecosystem services; the abolition of the Milk Marketing Boards in 1994 (Banks and Marsden 1997); and the abolition of milk quotas in 2015. The CAP provides direct financial support to dairy farmers through its two pillars: the direct support package (Pillar I) and the rural development programme (Pillar II). Interviewees noted that when milk prices are good the reliance on subsidy support is not as significant as some other sectors, or for those farmers in more deprived regions. However, in periods of poor milk price the basic payment is a lifeline, particularly for smaller farms and/or farms exposed to global market fluctuations.

Milk quotas were abolished in March 2015. The decision to remove milk quotas was motivated by the increase in demand for dairy products globally, especially in emerging countries like China. The quota regime was viewed as a potential barrier to EU producers responding to this growing global demand, hence limiting the EU dairy sector's competitiveness and growth. Along with opportunities for expansion and intensification of production, the abolition of quota also created production and marketing issues that dairy farmers had to face. Abolishing milk quotas had several implications, but two main effects were noted in the literature:

- *Production effect*: Predicting the changes in milk production due to the lifting of quotas is not straightforward. In theory, removing the quota should result in an increase in output and, consequently, in a decrease of milk prices (Kovács 2014).
- *Price effect*: The dairy market is not a single commodity market, but it is composed of several types of products, with different levels of processing (liquid milk, cream, powdered milk, butter, fresh cheese, mature cheese, etc.). This implies that each product can suffer from specific price effects.

Interviewees argued the abolition of milk quota was not really an issue for UK dairy farmers, because reaching quota has not been an issue for several years due to significant restructuring and downsizing in terms of dairy farm numbers. In other words, the UK has not been close to meeting its quota limit. However, as interviewees also pointed out, the removal of quota

impacts the wider milk pool, particularly at a European level. The impact of milk quota on UK dairy farmers has thus, so far, been indirect.

A “Milk Package” was published by the European Commission in March 2012. It consists of a series of measures and policy instruments devised to better support the participation of dairy producers in the milk chain, in response to the 2009 milk market crisis. It was also designed to help ensure the long-term future and sustainability of the dairy sector following the abolition of the milk quota system. The milk package measures have been applicable since 3 October 2012 and will apply until mid-2020. The measures constitute a major amendment to the Common Organisation of the Markets in Agricultural Products (Regulation (EU) No 1308/2013 of the European Parliament and of the Council) in which the milk sector is integrated. The overall aim of the package is to enhance information availability and the transparency of the market. According to the Milk Package, written contracts between dairy producers and processors can be made compulsory at member state level, and dairy purchasers are obliged to offer minimum contract durations to farmers. The contracts should be made in advance of delivery and must set specificities such as price, volume, duration, payments, collection and rules for *force majeure*. Contracts are expected to be negotiated and farmers may refuse offers of minimum contract duration. An important aspect of the package is the possibility for farmers to collectively negotiate contracts. With the abolition of milk marketing boards in 1994, the role of producer organisations (PO) has also increased.

Following the aid package, in April 2016, the European Commission published new rules providing the opportunity for farmers to jointly plan milk production. This option is provided in the context of Article 222 of the CAP Market Regulation (1308/2014), which was introduced for the first time in the 2013 CAP Reform. As interviewees explained in 2015, there was no plans at that time for the UK dairy sector to take advantage of Article 222, but other countries (e.g. France) were in favour of market stabilisation measures, including restrictions on the amount of milk produced.

Various regulations and legislation are of significant importance to dairy farmers, including the Animal Welfare Act 2006, animal health regulations and nitrogen reduction measures within the Water Framework and Nitrates Directives. The points noted in the interviews are as follows:

- In terms of animal health, diseases and related regulations fall into two main categories: ‘notifiable diseases’ and ‘non-notifiable diseases’. There are very few regulations for most non-notifiable cattle diseases. For instance, there are no specific regulations for lameness, mastitis or fertility, but supermarkets and other retail customers will have certain expectations and will require dairy farmers to meet minimum standards in terms of lameness, housing, etc. which are often included in milk contracts or via farm assured standards. The most significant piece of animal health regulation that impacts dairy farms concerns bovine Tuberculosis. Interviewees regarded animal movement restrictions as particularly significant and delimiting for dairy farms.
- In terms of the EU Water Framework Directive (Dir. 2000/60/EC), in the UK, one of the major challenges for the implementation of the directive is the reduction of diffuse pollution from agriculture. In the case of dairy farmers, the main source of pollution comes from nitrates from livestock manure. In total, 62% of the land area of England was designated as Nitrate Vulnerable Zones in 2010. If a dairy farm is within an NVZ zone the regulations are prescriptive regarding allowable nitrate levels and farms must have adequate slurry storage (6 months), which has meant significant investment costs for some farms.

- The UK Food Safety Act of 1990 is an important piece of legislation for the dairy supply chain. The Act defines the traceability standards required for food safety. Traceability can benefit high-value dairy producers who want to diversify their product from others, monitoring where their milk is processed and/or which are the most successful commercial strategies.
- The Red Tractor farm assurance scheme is an important voluntary standard. It was developed by the UK dairy industry to ensure benchmark standards of animal welfare and product quality at the farm level.
- The EU protection of food names legislation on a geographical or traditional recipe basis, introduced in the 1990s, is also of importance, particularly for producers supplying customers who produce West Country Farmhouse Cheddar (PDO).

Markets and marketing

Global, European and UK dairy markets are strongly integrated and changes in production volumes, supply and prices in one place can have repercussions on dairy markets at the opposite side of the globe. Drops in milk price were linked to the EU Russian trade sanction and oversupply of milk on the global market, for example. Despite the loss in market share, both the EU as a whole and the UK in particular are still major global dairy producers, and production volumes in the UK are relatively stable. Higher production volumes in 2014/2015 were followed by an increase in dairy exports, turning the overall UK dairy trade balance from negative to positive. The positive trade balance was mainly driven by liquid milk, while imports of cheese and butter exceeded UK exports (Bates 2016).

UK dairy farmers operate at higher average production costs than other global and EU producers, such as Ireland. The extra cost in the UK is 4 pence per litre (ppl) with respect to the global average. However, costs of production vary from farm to farm and they also change from year to year (DEFRA 2016). In the last ten years, total dairy production costs followed an upward trend, but since 2014 this trend has reversed. UK domestic milk production is not sufficient to fulfil demand for dairy products, with milk from UK dairy farms supplemented by imported milk. The bulk of available milk, including imports, is almost entirely transferred to dairy industries and cooperatives which transform half of the raw milk supplied into manufactured dairy products (e.g. cheese, yogurt, desserts), with the remaining raw milk pool treated according to different specifications and sold as liquid milk for human consumption.

Overall, the dairy sector concerns mainly fresh and highly perishable products which need adequate logistical organisation to be distributed daily throughout the UK. Whilst farmer engagement in processing is rising, almost 91% of UK milk is purchased and processed by dedicated processing facilities/companies, which process over 100 million litres of milk (Dairy UK 2013). There are five major organisations leading the UK dairy industry. Three are UK co-ops: Arla Foods, First Milk, and United Dairy Farmers; one is a public UK company: Dairy Crest; and one is a German-based private company: Müller Wiseman Dairies. The UK dairy industry and supply chain is therefore characterised by a relatively low level of concentration compared to continental counterparts, hence further opportunities for industry rationalisation and merges still exist (Dairy UK 2013). UK dairy processors typically have direct links with dairy farmers and purchases are often ruled by specific contracts (see below), but not all milk bought from farmers is processed by the purchaser; the purchaser can sell the liquid milk to other companies for processing. A substantial percentage of UK milk goes into the ingredients sector (as processed

milk). This sector is diverse and fragmented but continues to grow as consumers eat more processed and prepared foods (Dairy UK 2013). The UK retail market is dominated by four major supermarkets (Tesco, Asda, Sainsbury's and Morrisons), accounting for 76% of all dairy sales in the UK. Only a small proportion of the industry's total output is sold directly to consumers via doorstep delivery service or through local markets.

Milk price is a major and sensitive issue for dairy producers. However, farmers receive different prices depending on the buyers and product quality (see contracts section below). There are two further issues to consider: *asymmetric price transmission* and *price volatility*. In relation to the first issue, when discussing dairy prices in the UK it is important to distinguish between three price categories: 1) farm gate prices; 2) wholesale prices and; 3) retail prices. The dairy supply chain is characterised by asymmetric price transmission – i.e. prices at different stages of the chain do not move up and down in line with each other (Ruslan 2011). Asymmetric price transmission is due to: differences in market power between supply chain actors; differences in market and cost structures across actors; government intervention; and the value added by manufacturing of dairy products with respect to liquid milk. For these reasons, the price received by farmers can be disproportionately small when compared to the price of the final product sold in supermarkets. Regarding milk price volatility, in the last ten years it has increased in the EU and in the global market (Tangermann 2011), which coincided with a progressive reduction of farmers' protection towards a more market-oriented EU agricultural sector (Bardaji 2011). Price volatility is often considered a negative issue related to low prices and income instability. However, price volatility can also be advantageous to those who can seize opportunities and build strategies around it (Assefa *et al.* 2015).

To understand why UK dairy farmers are particularly exposed to price volatility, it is important to understand the peculiarities of the UK dairy market. About 65% of dairy production in the UK is sold as liquid milk, with only 25% is turned into cheese and 10% into powders and butter. This contrasts with the rest of Europe, where only 30% of dairy production is sold as liquid milk. Since liquid milk cannot be easily stored in the same way as milk powder or cheese or butter, UK farmers tend to be more affected by volatility and global market changes (DEFRA 2016). When prices are low, farmers' production decisions can be affected, influencing farms' productivity. Milk demand in the UK is quite inelastic, meaning that the volumes of milk sold do not change dramatically if milk prices change, because milk supply in the UK is a staple good (DEFRA 2016). The "price war" around milk thus reflects asymmetric price transmission. Supermarkets are transparent in stating that the retail price is not necessarily related to the farm-gate price. Only around 7% of the milk produced in the UK is sold on the basis of a pricing mechanism which relates to the cost of production.

The main benefit of production contracts for farmers is achieving a degree of price stability, by agreeing in advance the purchase price. This provides a certain degree of protection from price volatility. However, contracts can also have disadvantages. For example, producers can face penalties if they decide to exit the contract before the signed ending of the agreement. To enhance contractual relationships within the supply chain, the industry agreed the Dairy Industry Voluntary Code of Best Practice on Contractual Relationships in September 2012. The code was developed to improve the equity of contractual relationships and to provide an alternative to the government regulation of contracts. Adoption of the code is voluntary, but currently involves 85% of UK milk purchasers (Dairy UK 2013). The code provides purchasers

with greater flexibility in deciding purchase prices according to developments in the market place and farmers can in theory obtain fairer prices, security and continuity with respect to market access (Dairy UK 2013).

The story of organic milk is different to conventional milk. Similar to supermarket-aligned conventional dairy farmers, the price for organic milk is currently good. The situation was different a few years ago when some organic milk producers exited and returned to conventional. This is not the case now. The UK is the second largest organic dairy market in the EU, involving about 11% of dairy producers (OMSCo 2015). From 2013 to 2014 the organic sector experienced 6.4% value growth compared to a decline of 1.6% in the conventional milk sector. The UK dairy organic sector is dominated by private label and branded products. The leading brand, Yeo Valley, recorded a 13.2% increase in sales value, versus 4.5% for private label organic dairy sales (OMSCo 2015). Although organic represents a key strategy in the UK for dairy farmers to achieve price premiums at a time of depressed milk prices, supply for UK organic milk is currently in balance, and there is little scope for new producers to enter the market (OMSCo 2015).

Standards such as the Red Tractor play an increasingly important role as a system of private governance. Standards are important also for international trade. Some interviewees noted, for example, that European standards will need to be reached even if the UK is not in the EU. Interviewees also noted farmer frustrations regarding the paperwork required to comply with standards and duplication between some standards.

Focus groups, supply chain interviews and workshop feedback

Three focus groups were held with Somerset/north Devon dairy farmers in March 2017. To complement the focus group data, 11 *supply chain interviews* were completed with dairy processors, farmer co-operative representatives or individuals who were in some way involved in buying milk from dairy farmers and/or helping to set up milk contract arrangements. This helped to deepen the analysis and understanding of different institutional arrangements available to dairy farmers. Two members of the research team also meet with Defra in April 2017 to inform them about the ongoing research work and proposed plans in relation to Brexit. It was too early in the research cycle to report concrete findings but some preliminary findings were reported in terms of new contractual arrangements. A *workshop* was subsequently conducted in May 2017, following reflection on the focus group and interview data, to firstly present the key findings of the research conducted for feedback and comments, and secondly, to discuss a range of scenarios regarding the future viability of dairy farming in Somerset, linked to the Brexit negotiations. Analysis of the interview and focus group data revealed six key areas, as well as Brexit, which are summarised below.

1. *Milk price and price volatility.* Participants argued that milk price volatility was a key characteristic of the dairy industry. Volatility was intensifying, resulting in more dramatic highs and lows, as well as becoming more frequent. Participants understood milk price volatility as the product of global issues, rather than an isolated national problem. Low milk prices in 2015, for example, were linked to lower global demand of milk combined with milk oversupply, the ban of dairy exports to the Russian market, and the deregulation of the EU milk quotas. As a dairy farmer, low milk price is the key issue and underlying concern, but

price volatility is also significant because of the challenges and uncertainty it creates in terms of farm management. Participants agreed that issues of oversupply and undersupply were the key cause of market volatility and that producers needed to be far more sensitive to the market in order to maintain a stable milk price. The terms 'accommodation milk' and 'milk washing' (i.e. oversupply) also emerged in the focus groups as a cause of milk price volatility. Price wars between supermarkets, started initially by 'Iceland', were also blamed for triggering price lows.

2. *Institutional arrangements for milk.* The supply chain interviews identified a number of different institutional arrangements for selling milk. These different arrangements represent different strategies that potentially help dairy farmers to manage market volatility. For dairy, these arrangements are essentially different types of contract. Some have been in place for some time but there are developments within these arrangements (e.g. new pricing mechanisms) in response to volatility. The analysis suggests contractual relationships in the UK dairy industry are highly developed. Dairy farmers can engage with the dairy industry through a variety of contract types (see below). In general terms, it is possible to distinguish between collective and individual arrangements:
 - Collective organisational sales
 - (i) Co-operatives (e.g. Arla, OMSCo, First Milk)
 - (ii) DPO (Dairy Crest Direct)
 - Individual sales
 - (i) Supermarket aligned contracts
 - (ii) Direct to processor/milk buyer (e.g. Muller non-aligned, Crediton Dairies, Barber's, Wykes)
 - (iii) Informal arrangements (direct to the consumer, such as a milk hut)

In the case of the former, the contract concerns a group of farmers and the members can benefit from improved bargaining power.

3. *Contractualisation and pricing instruments.* Contracts are an increasingly important feature of dairy supply chains. The analysis used the following attributes of contract arrangements to compare dairy contracts:
 - Pricing determination
 - Length of contract in years
 - Cancellation/notice period
 - Quantity to supply buyer
 - Exclusivity
 - Price change notice period

In terms of price determination, the main pricing mechanisms used are as follows. First, cost of production plus, in which the farmer receives a price for their product that covers cost of production as a minimum, plus a bit more, ensuring sustainable profitability of their business. They applied in supermarket-aligned contracts and account for about 10% of the industry. Second, A and B pricing, which is a pricing matrix with a core price and a market realisation price. This was used by Dairy Crest Direct and some of the smaller dairies and

cheese producers, such as Crediton and Barber's. There is some debate about whether A and B pricing is the best way forward, or whether it would be better to just have one price. Third, formulaic or basket pricing, where dairy farmers are offered one price for their milk for a period, which is derived from four or five prices currently offered by processors in the market. This pricing mechanism was used, for example, by Muller (non-aligned contracts), the Arla co-operative as well as one smaller milk broker. There is some debate about offering future prices for milk but currently only one dairy, Yew Tree Dairies, offer this hedging option, although Muller plan to introduce this option for one of their manufacturing contracts. Most contracts examined were exclusive and evergreen and producers are usually notified 12 months in advance if a contract will be cancelled. In terms of price changes, the notice is usually 30 days. The biggest difference in contracts is in terms of the quantity supplied. Processors who favoured A and B pricing, including one who was present at the workshop, argued it was a good way to control supply. This was critical for smaller cheese processors and dairies. Co-operatives like Arla have no limit and guarantee to take whatever a farmer produces. Muller require farmers to notify them if they will exceed 10% of their previous milk year. There is some debate about what mechanism is best, with some arguing no limit contracts were one of the reasons why oversupply happens.

4. *Collective action (DPO and co-operative models).* The DPO model was closely examined in this study because in theory it gives producers greater power in terms of negotiating contracts. So far there has been limited uptake of this option. Those farmers participating in the Dairy Crest Direct DPO, the only one running in the UK, felt it was beneficial. Some argued it was the next best thing to a co-operative. It was recognised that the scheme was rather cumbersome (at least as implemented). Stakeholders and farmers recognised the need for greater co-operation to sell milk, including joint ventures at a farm level (to share capital, expertise, etc.). Although there is only one DPO, a number of milk pools set up by other dairies were effectively running as DPOs, but without the formalised governance structure. There was some concern that the Dairy Crest Direct DPO did not have any leverage over the price the processor is offering. Several farmers surveyed supplied Arla. Farmers in the focus groups were passionate advocates of the co-operative model. It was argued that a strong co-operative was critical to farmers when it came to negotiating milk prices.
5. *Market data and futures.* A wealth of market data and statistics exist to support dairy farmers and processors in their decision-making. In the literature the high degree of one-way transparency and information asymmetry in favour of the retailers has been described as 'highly unfair' (Lehman *et al.* 2013), positioning retailers in a stronger position to assert price claims against dairy companies. However, with reference to the availability of such information, some focus group participants and dairy processors argued farmers can, and should, use this information to their advantage. Although this data is widely available, and can be used to improve farmers' bargaining power, a number of interview participants noted farmers' lack of engagement with such material. This is because a lot of dairy farmers are simply too busy. Interestingly, some dairies and processors that were interviewed, notably Barber's, were making efforts to get farmers to engage with such material. Dairy farming in a time characterised by such volatility will require, it was argued, a different set of skills – particularly business skills – which will require closer engagement with market data and futures. Workshop participants and interviewees were positive about the use of futures data as a means of controlling milk price volatility. In this regard, futures contracts can help in

planning cash flows, as they help farm business management on the basis of a guaranteed income for the milk commodity. This form of contract, which has an element of hedging is now being discussed much in the dairy sector. At the moment futures contracts exist for butter, skimmed milk powder and whole milk powder.

6. *The future (succession and social drivers)*. There was significant concern that opportunities in dairy farming remained limited for young people without familial connections to the industry because of the high start-up costs. Whilst participants recognised opportunities to be employed as a non-familial employee were abundant, they feared entry into the industry in any other way was typically impossible because of the capital required to do so. This concern prompted participants to appeal for innovative start up initiatives such as share farming schemes developed in New Zealand. Participants recognised an increase in interest in and enthusiasm towards agricultural work in contrast to recent years. This positivity ties in with wider observations in the academic literature of a renewed interest in agricultural careers, attributable to the (re-)emergence of food security in the political agenda in developed market economies. Whilst there was significant positivity about interest in the industry, others described dairy farming as generally unappealing – mainly relating to the unsociable working hours required, but also relating to the hard work required. Whilst a familial connection to the industry had been recognised as often the only way into farming, the family structure was also identified as problematic for the progression of young people in the industry. This issue – also known as the ‘farmer’s boy problem’ – has previously been recognised in the family farming literature (Chiswell, 2016) and is considered highly debilitating for the younger generation. There is scope here to think about how to facilitate succession in the dairy industry, so as to allow ‘young blood’ to come through and benefit the industry.

Brexit

Brexit represented a divisive topic. Participants had a range of views and responses to the Brexit vote and cited a range of potential implications for the dairy industry after the UK exits the European Union. Some respondents refused to speculate on Brexit impacts because of the uncertainties surrounding future trading options. In general terms, focus group discussions identified three key concerns:

- Trade and a trade deal
- The availability of labour
- Subsidies and competitiveness

Trade, and specifically whether a trade deal with the EU would be secured, was the biggest post-Brexit concern amongst participants. Unsurprisingly, groups that were reliant on exports and/or the ability to move products across European boundaries were most concerned about the impacts of no trade deal.

In the participatory workshop four Brexit scenarios (adapted from van Berkum et al. (2016) and Buckwell (2016)) were developed relating to **trade** and **policy support**:

Scenario 1: Baseline/status quo

Under this scenario the UK leaves the EU, but continues to have free access to the Single Market and continues to have full access to the four EU ‘freedoms’ (labour, capital, goods and services).

As part of this scenario, the UK would adopt a British Agricultural Policy (BAP), requiring the same budget contributions as the CAP. Direct support would remain the same as current levels.

Scenario 2: A Free Trade Agreement (FTA) between the UK and the EU

Under this scenario the UK seeks a FTA with the EU. This option is not as advantageous as free access to the Single Market that EU membership confers but inclusion in the EU Customs Union is a possibility. Whilst some products will not be subject to tariffs, ‘sensitive products’ such as milk may be subject to some form of tariff e.g. Tariff Rate Quotas. Agricultural matters are normally the most difficult part of any FTA, so a functioning FTA may take many years to be agreed.

As part of this scenario, levels of direct support would be 50% of their current levels.

Scenario 3: WTO-default position – ‘no deal agreed’

If no deal were to be agreed, the UK would revert to the WTO-default position and would trade with the EU on the same basis as other WTO members. In other words, UK imports/exports would fall under the WTO’s non-discrimination Most Favoured Nation (MFN) rules and would be subject to a 36% tariff. The EU would apply a Common Customs Tariff (CCT) to UK imports and border and customs controls would increase.

As part of this scenario, levels of direct support would be 50% of their current levels.

Scenario 4: UK trade liberalisation

In this scenario, the UK allows wider access to UK markets by reducing tariff rates by 50% across the board (i.e. removes barriers to trade). This scenario is similar to the WTO-default scenario, including increased trade facilitation costs, with the only difference that the UK and the EU have different border tariffs: the UK applies 50% MFN tariffs to all imports and the EU applies CCT to UK exports to the European Union.

As part of this scenario farmers would no longer receive any agricultural support.

The four scenarios were designed to facilitate a discussion with key stakeholders from the industry on the future of the dairy industry and more specifically the potential impacts of Brexit (depending on the final outcome) on the dairy industry in Somerset and beyond.

General reactions to the scenarios:

- As was the case during the interviews and focus groups, workshop participants were uncertain about what post-Brexit scenarios were most likely to prevail. There was a preference to talk about the implications of Brexit in general terms.
- Overall, it was felt that whatever scenario was adopted, it would be less protectionist than the status quo and would expose the dairy industry to more competition, for which it would have to be fitter and more competitive.
- Workshop participants perceived one of the biggest challenges associated with Brexit to be the infrastructure and manpower required to deal with border control.
- There was a feeling amongst workshop participants that in anticipation of the policy change, Brexit was *already* having an impact on farmers in terms of their business decision making and the availability of labour.
- It was noted that reliance on labour extended beyond the availability of seasonal labour in the dairy industry, which has relied on European workers to perform skilled work (e.g. input via the veterinary profession) for a substantial period of time.

Preference and likelihood of the scenarios

- After the status quo, the FTA was considered the most desirable option (and perhaps the most likely option in the long run). However, participants felt it was not going to be easy to implement and would likely take some time – perhaps even a decade.
- There was a feeling that a trade liberalisation scenario would be ‘dangerous’. Participants attributed this to the issue of equivalency; liberalisation could mean that US products, not made to the same standard as the UK, would be able to undercut the UK’s prices. It was synonymous with a ‘hard Brexit’ throughout the discussions.
- However, participants made a number of references to the success of New Zealand compared to protectionist regimes such as Ireland.
- Scenarios one and four were viewed as least likely. Much of the discussion focussed on scenarios two (FTA) and three (WTO) – the middle scenarios.
- Participants saw the WTO as a possible interim option on the way to a FTA, and felt the eventual outcome might be ‘somewhere in the middle’ depending on the negotiations.
- Although there was initial enthusiasm for domestic producers under a WTO option, there was concern that becoming entirely self-sufficient in dairy would eventually thwart both investment and innovation.

Opening the door to competition: implications for dairy

- It was anticipated that dairy farming following Brexit would need to be more competitive, regardless of the exact scenario adopted.
- Without the security of unlimited free trade within the EU (the status quo) and direct support, it was felt that the dairy industry would need to ‘up its game’ to compete in the global market.
- Overall participants took a more positive view on the potential reduction of agricultural support; they felt it offered an opportunity to revise the way agricultural support is targeted and could eventually help to increase the industry’s productivity, efficiency and resilience in the global market.

- Rather than direct support, workshop participants anticipated indirect mechanisms, i.e. payments for research, skills development and teaching, tax incentives etc. as a possible way of delivering agricultural support for a more efficient dairy industry.
- Some participants recognised the WTO position as an opportunity for domestic production. This demonstrates the importance of recognising the different institutional arrangements when considering the implications of post-Brexit policy on UK dairy farming; different scenarios will have different implications for the different arrangements.

Producer survey

The results of the Producer Survey (Task 2.6) are presented in relation to dairy farms in Somerset and Devon. The questionnaire was composed of the following sections:

- A. Farm business characteristics
- B. Production and sales channels
- C. Characteristics of the sale agreement and sustainability
- D. Strategies and drivers of farming
- E. Farmer characteristics

For the purposes of this report, data are analysed using descriptive statistics. The sample is composed of 88 farms located in Somerset and 112 in Devon. This proportion reflects the higher total number of dairy farms in Devon.

The survey highlights the following characteristics in relation to the farm and farmers:

- The majority of farmers were male (89%)
- The majority of farmers were between 41 and 65; young farmers only accounted for 12.5% of the sample
- Farmers typically had a high school education
- 57% of farmers had an agricultural education
- Family farms (as opposed to private companies) were the dominant organisation (81%)
- Organic farming only accounted for 5.5% of the farms
- More than half of the survey participants expected that one day the farm will be taken over by a family member (54.4%)

Interestingly, **being a member of at least one farmer organisation was very common** in Somerset and Devon. About 3 out of four farms (74%) were members of a farmers' union. Membership in cooperatives and/or POs were also quite frequent among dairy farmers.

The survey highlight a range of different roles played by farmers' organisations in terms of sales arrangements. The main role was to buy farmers' milk (82%), but also provided a wide range of services *beyond* purchasing milk, e.g. acting as intermediaries with other buyers and supporting the design of contracts between farmers and buyers.

The producer survey reveals the average dairy farm size in Devon and Somerset was 183.7ha, which is considerably above the South West and national averages of 70ha and 86ha respectively. The average herd size was 237.6 cows, with an average productivity of 7.9 thousand litres per cow, per year.

The survey highlights the **importance of farm income** to total income for farm households, with just under 90% of income coming via agricultural activities. Within farm income, milk was unsurprisingly the main source (accounting for 80.7% of this farm income).

Over half the farms in the survey did not diversify and were therefore purely specialised in milk production. The main **risk management strategy** was reported to be **insurance**, however, there were significant differences in the uptake of insurance for livestock, compared to crop cover.

The survey revealed significant differences between the types of sales for collective and individual organisations. Differences included the duration of contract, moment of payment and costs associated with the arrangement/agreement. The attributes and services associated with dairy sale agreements also differed between collective and individual organisations.

Milk price and production costs continue to be a controversial topic. The survey revealed how production costs are 81.7% of prices but in some circumstances production costs were as much as 140% of prices. The analysis considers reasons why the cost of production can differ so significantly for different farmers and selling arrangements.

Overall, all farmers were quite satisfied with the agreement they have for their main milk sale, with an average answer close to 4 out of 5. Farmers selling to individual businesses were particularly satisfied. The reason for such a high level of satisfaction seems to be linked to the fact that the agreements guarantee higher prices and, even more important, that prices were fairly stable, mitigating the risks of price volatility.

One key objective of the survey was to gather information about how farmers perceive the sale agreements they have in place in terms of sustainability. On average, the overall sustainability of the arrangements is just above the threshold 3 (on a scale of 1 -5), for both arrangements with collective and individual organisations.

The focus of the survey was on producers' sales agreements with buyers; however, additional questions regarding future farming strategies and the drivers of potential farming changes were also asked. On average, all farms blame low market prices and price volatility as key drivers of dairy farming production strategies, underlying the importance of market uncertainties for this sector and the dominance of market factors in farmer thinking.

In terms of future strategies, the majority of dairy farms (53.5%) do not have particular strategies in mind and they expect to maintain their existing scales of operation. Only 6.5% of all farms expected to abandon farming altogether.

CSP inventory

The final component of this report is a summary of the inventory data pertaining to both UK dairy and fishing conditions, strategies and performances.

Dairy

- Key conditions
 - Price levels and volatility as a condition was cited 11 times, representing 37% all reported conditions for this commodity
 - Regulation and policy were the second most cited condition (23%)
 - Socio-demographic conditions accounted for 10%; as did market access and ecological/environmental conditions
 - Demand conditions (7%) were less discussed compared to other conditions
 - Factor access was the least cited condition (3%)
- Key strategies were diverse, although market orientation emerged as the most significant strategy; in the absence of quota, production has increasingly become based or oriented towards market demand
 - This variety of strategies reported in the CSP inventory reflects the heterogeneous nature of the dairy sector. There cannot be one strategy to address all the issues faced by the sector. In fact, just as the removal of quota can be viewed either as a business opportunity or a risk factor, Brexit can be also be perceived an opportunity or threat, dependent on the farm business involved.

Fish

- Key conditions
 - Regulation and policy conditions were the most cited, representing 34% all reported conditions for this commodity. This is unsurprising given their role in the operational aspects of inshore fisheries, particularly in relation to what can be caught and when.
 - Market access was another significant issue (19%)
 - As was ecological/environmental conditions (16%) – this was mainly related to marine protection
- Key strategies
 - The inventory strategies data suggests how inshore fishing is not only about catching fish and in order to survive the challenges highlighted by the report, fishers have to deploy a range of strategies to ensure they can earn a living. The most dominant strategy was market orientation (25%), followed by training, advice and investment in research and development (13%) and a deliberate focus on environmental issues (13%)
 - The sector's sustainability depends economically on accessing new markets, and on the long-term availability of marine resources. Some fishers are turning to processing as well as investing in direct marketing. Added value is a key aspect of many strategies which seek to differentiate fishing businesses from each other and thereby earn a better price on their products.

1 Introduction and methods

The purpose of this UK report is to investigate the nature of policy requirements, market imperfections and their implications for the resilience of inshore fishing in the county of Cornwall and dairy farming in the county of Somerset, respectively. It is based on the conceptual framework developed in WP 1, and aims to go beyond the relatively fragmented insights consolidated in WP 1 to produce a more comprehensive and holistic view of the conditions faced by inshore fishers and dairy farmers and the strategies they employ to ensure their sustainability, resilience and continuation. The two case studies have their own sections with the UK National Report, but it will become clear that many of the issues faced by inshore fishers are also faced by milk producers. This is significant and a key benefit of conducting simultaneous investigations into these two different primary production sectors. In this report the main objective is to identify key market and regulatory conditions as they relate to and impact upon the commodities and regions selected for analysis. Regulatory and market conditions are the focus but other conditions (e.g. social conditions) that have emerged as important are also reported. A comparison between the two sectors is not provided in detail in this report, but in the final report similarities will be highlighted where appropriate, as well as the distinctive nature of the responses, thereby having the potential to provide a valuable learning experience.

For both inshore fisheries and dairy a media analysis was conducted, as well as a desk-based analysis of market conditions and regulations for each case region/commodity, supplemented with expert interviews per case study. In more detail, the media analysis examined national, regional and specialised media from 2005 to 2016, with a focus on publications reporting on the economic and financial sustainability of primary producers. Table 1 summarises the press coverage in terms of the types of sources analysed. Specialist media were derived from three main sources: 1) industry-related publications and specialised magazines; 2) government-related publications and 3) public-orientated publications, including material from NGOs, blogs and newspaper articles.

Table 1. Summary of media analysis sample

Source	Number of articles analysed	% of sample
National press	112	47%
Regional press	65	27%
Specialised media	62	26%
Total	239	

The desk-based review involved analysis of key policies, regulations and market issues that impact on fishery and dairy producers in Cornwall and Somerset, respectively. Sources reviewed included academic publications (research papers, books and websites related to sectors and/or key regulations, policies, market issues, standards or instruments); Government and policy documents and websites; market data, market research and consultancy reports; industry data/reports and NGO documents. A number of academic articles were reviewed for both sectors, with particularly good research coverage in relation to inshore fisheries. The Common Fisheries Policy (CFP) and the Common Agricultural Policy (CAP) were both reviewed in detail, as well as relevant regulations related to each sector, supplemented with analysis of policy documents. The key standards for both sectors were also reviewed. Market research and data

on each commodity sector was also reviewed, as well as relevant industry data, including analysis of secondary data to examine socio-economic changes in both sectors over time.

The analysis of market and regulatory conditions was designed to reflect two things: firstly, it reviewed what the current market and regulatory conditions are; and secondly, it reflected the perceptions and experiences of those who have to work under those market and regulatory conditions. In other words, it was not necessary to provide a detailed account of the history of specific policies or regulations, but instead gave a sense of policy evolution in order to contextualise the current situation. The aim was therefore to review the most recent papers, reports, market data etc., although older material was accessed to understand production changes. The review of both sectors thus covered: an overview of the key policies / regulations; quota or subsidy issues; environmental regulations/legislation or management issues; zoning laws; sector specific regulations; analysis of relevant public and private standards (e.g. food safety standards set by the EU, government regulations, or private standards set by food retailers or processors; analysis of market conditions and finance markets (in the form of product markets) (i.e. just buying and selling issues and not factor markets).

The review thus describes the key components that relate to and condition our specific commodities studied. Some issues emerged in both the regulation and market analysis sections because of their interrelated nature (the trading of fish quota, for example, is both a regulation and market issue). Producers' structural diversity was also accounted for e.g. differences in structure that may result in different strategies.

The stakeholder interviews were intended to supplement the desk-based review. The aim of the interviews was therefore to gain further insight into the nature and complexity of market and regulatory conditions and emergent CSP issues. Having conducted a desk-based review of the literature available on each commodity, the interviews were used to make sure the report provides an accurate and up-to-date grasp of the issues by asking those stakeholders who are directly involved in the sector for their inputs. In other words, from their perspective what are the key issues, especially in relation to regulations and markets, that need to be accounted for in order to develop sustainable and resilient systems of production. A total of 30 interviews were completed for the UK National Report, 13 for dairy and 17 for fisheries. The interviews completed for each sector are listed in Appendix 1 and 7, with a summary of the type of stakeholder interviewed in each case. Inshore fishing is a new area of research for the team so a few more interviews were necessary. The interviewees provided invaluable insight into regulatory and/or market conditions in the two commodity sectors, including also the perspectives of three interviewees from the banking sector. Most interviews lasted one hour or so, but some were longer than this. As mentioned, the interviews covered regulatory conditions and market conditions for each sector, but in some cases the interview focused on a particular theme (e.g. the nature of markets for milk, marine regulations for inshore fisheries). Whilst the research was being conducted, the UK public voted in a referendum and decided to leave the European Union (Brexit). Brexit is likely to provoke major changes in all UK economic sectors, particularly agriculture and food. A new section has been added to the report which provides a review of how Brexit might impact agriculture and, in particular, the two commodity sectors studied for SUFISA. This provides a key piece of regulatory and market change for the UK and will be further studied and updated in the final report.

The structure for the rest of the report is as follows. The next section of the report provides a summary of the key media analysis findings, both in general and in relation to dairy and inshore fishing. An overview of the Brexit vote and its potential implications for both sectors is then provided. The main part of the report is then made up of the two commodity case studies, which firstly reviews key regulatory and market conditions for inshore fisheries and dairy farming respectively, including a summary of the key issues/conditions emerging in both sectors. It then examines strategies employed by producers and other actors in each commodity chain to manage their business, especially in relation to regulatory and market issues. The strategy-level analysis also provides further assessment of Brexit using data collected with stakeholders from each sector

2 Media Content Analysis

2.1 Introduction

The media analysis presented here is focused primarily on the sustainability of primary producers in the dairy and fisheries sectors in the UK. In more detail, this section summarises key findings from a media analysis exercise which sought to identify the most debated issues in relation to primary producers' sustainability in agriculture generally and in the dairy and inshore fisheries sectors specifically. The media analysis methodology has been described above. Key findings from analysis of national, regional and specialised media sources from 2005 to 2016 is presented below, starting with analysis of media discourses for UK agriculture.

2.2 The predominance of price volatility in media discourses about UK agriculture

In terms of the agricultural sector generally, price volatility was found to be a predominant theme in the articles sampled. The media analysis suggested that farm businesses are nowadays operating in a less stable and more complex global economic environment. Price volatility in media publications is understood to mean excessive price fluctuations and variations in agricultural commodity prices over time. As noted in one source, the problem with price variations arises when they are not predictable (Farmers Guardian, 18th March 2015). This degree of uncertainty combined with low prices received by farmers for their produce challenges the capability of farmers to cover their costs and to make a living.

The European Union Committee report on price volatility published in May 2016 states that successive CAP reforms, which have gradually reduced price support over time, have incrementally resulted in farmers being more exposed to market forces. The position of the committee is nuanced in terms of what price volatility is and its impacts on farm business economic sustainability. For example, price volatility is viewed as "an inherent feature of agricultural commodities markets" and "that the adverse effects at farm level are caused more by unanticipated periods of sustained low prices than by an increase in levels of volatility" (European Union Committee, 2016).

Price volatility is not a new topic - it has featured in media discourses for some time and particularly since the 2008 credit crunch. In 2008 wheat prices fluctuated from £75 to £170 per tonne and back down, all in the space of 24 months. In the same period tractor diesel went from 35p a litre up to 67p a litre and then dropped back down again. For dairy farmers, the milk price also fluctuated significantly during this period and according to some industry sources the price has not really recovered since, despite some occasional spikes in price. Such uncertainty is reported to pose significant issues for farmers, particularly in terms of profit and cash flow (Western Morning News (Plymouth, UK), 22nd December 2008).

For Promar's divisional director, the combination of fluctuating oil prices combined with the impacts of climate change, population growth, changing dietary patterns, and increasingly deregulated world markets has created a set of external market conditions that have resulted in the current period of market volatility (Farmers Guardian, 8th June 2015). The dairy sector is noted as "[a] prime example of global volatility's influence on the UK farmgate...[which has led to]... the current commodity downturn." He notes that high levels of production globally at that time implied a well-supplied market. However, falling demand in China combined with the Russian import ban on European goods drove UK average dairy prices down, from 33.7ppl to 25.45ppl in 2014 to March 2015. What this example shows is the increased exposure of some commodity sectors to global markets and socio-economic pressures.

Several strategies to curb the negative effect of price volatility were discussed in the media sources. It was suggested, for instance, that a variety of forward selling and hedging strategies are available in the arable sector (Western Morning News, 22nd December 2008); however, the structure of a sector like UK dairy means that farmers often remain reliant on their buyers determining farm-gate prices (Farmers Guardian, 8th June 2015). For the European Commission, direct income payments are considered as a source of financial stability, which help farmers to withstand periods of low commodity prices (European Union Committee, 2016). The NFU shares this position and argues that these payments provide a form of security against which farmers can invest and leverage additional private investment from banks (NFU Online, 17th May 2016). The tax system change in 2015, which extended farmers' averaging to over a five-year period, is expected to facilitate planning and budgeting and hence help primary producers to manage cash flow problems (Farmers Guardian, 18th March 2015). Overall, the media analysis suggests that to cope with market volatility, government support, including subsidy support, and tools from the financial sector are necessary.

2.3 Inshore fisheries

The media discourse related to the sustainability of inshore fisheries businesses is mainly debated in regional and specialised media sources and much of the discourse is framed in relation to the EU-imposed Common Fisheries Policy reforms- i.e., fish stocks and discard bans, marine conservation zones and quota allocations. In the following analysis, we summarise the main issues debated and reported in the media.

- The **fishing quota system** is reported to carry inequities which are a source of frustration for inshore fishers. In 2013, the High Court ruled in favour of reallocating some fishing rights from big producers to small-scale fishers. Whilst the judge ruled that the initial distribution of quota did not amount to discrimination, £1 million worth of quota was reallocated to small-scale

fishers (BBC News, 10th July 2013). The issue is a persistent problem according to surveyed media sources. An inshore fisherman is quoted as being 'beaten down' and 'robbed' ever since the quota system was introduced and it was reported that 5000 small vessels in the UK had access to just 4% of fishing quota (The Independent, 4th November 2014). The Chief Executive of the New Under Ten Fishermen's Association (NUTFA), Dave Cuthbert, argued that the restricted quotas were affecting the livelihoods of many fishers, adding that some could not make a living and were turning to work in factories or other forms of alternative employment (The Independent, 25th January 2015, Serina Sandhu).

Inshore fishers' case is argued and supported by organisations such as The New Economic Foundation (NEF) and Greenpeace UK. For example, for NEF reported that "[w]ell-resourced fishers and other large Producer Organizations have been able to trade and accumulate quota. This has resulted in an extreme concentration of quota towards larger organisations over the past decades and has come at the expense of smaller fishers. This means that the majority of working fishers have few rights to this costly tradeable commodity, even though they are able to easily catch it" (NEF blog, 21st October 2015, Chris Williams). Greenpeace and inshore fisheries groups were reported to be joining forces in campaigning against trawlers and larger-scale fishery enterprises that monopolise quota (Greenpeace, 23rd January 2015). In arguing that case it is noted too that larger-scale fishers use trawling and dredging which are highly damaging to the environment. While it has been pointed out that the vast majority of inshore fishers use selective and sustainable techniques (Greenpeace, 8th August 2012), trawlers and dredgers not only drag up the seabed, but they also drag up the crab and lobster pots laid down by inshore fishers (BBC Two, February 2012, The Fisherman's Apprentice with Monty Hall).

However, opinions diverge in the industry regarding the sustainability of larger-scale vessels. Barry Deas, Chief Executive of the National Federation of Fisherman's Organisation, which represents the interests of both inshore fishers and larger-scale industrial vessels, argued that "it was 'sheer nonsense' to say the larger vessels were unsustainable" and noted that "[m]any of these vessels fishing large shoaling offshore stocks like mackerel and herring are operating in exceptionally well managed fisheries... if these pelagic quotas were reallocated to the inshore fleet, they would remain uncaught" (The Independent, 25th January 2015, Serina Sandhu).

- There is a significant **regional disparity in terms of fish stocks** in the UK. The Centre for Environment, Fisheries and Aquaculture Science (CEFAS) advisor Ewen Bell stated, for example, that lobster stocks in the West of England are 'OK and being fished sustainably... Those in the North West have been hit much harder' (Western Morning News, 12th April 2015). There is also debate within other sources about the levels of seafood available. The National Lobster Hatchery in Cornwall talk, for example, of UK stocks being depleted and this is backed up by Seafish, the UK public body that promotes the seafood industry – they mark all lobster stocks in the UK as 'high risk' (The Daily Telegraph, 3rd April 2015).

It is interesting to note the discrepancy in narratives. An important narrative in some media reports analysed is the idea that fisheries are extremely important to communities, so local reporting in some places may focus less on fish stock problems despite the reality. Generally, scientists tend to be quoted and reported when commenting on depleting stocks of fish. Clyde fishery has received special attention, with York University conducting research there and finding that stocks are at significant threat of collapse (The Scotsman, 27th May 2013). However,

the Clyde Fisherman's Association contested the findings and argued that the situation was not as bad as had been reported (Herald Scotland, 23rd November 2015). There is a feeling in fishing communities reported in the media that they understand stocks well, and it often takes too long for policy to respond to this (BBC Two, February 2012, The Fisherman's Apprentice with Monty Halls).

- There is also **regional disparity in terms of regulations concerning fish size**. Scientists are keen to see regulations on fish size tightened to assist in protecting and maintaining fish stocks. CEFAS suggested fish size should be altered to protect stocks whilst accepting that this could have major implications for inshore fishers (Eastern Daily Press, 18th November 2013; The Telegraph, 16th November 2014). However, there has also been praise for the authorities for implementing regional standards rather than across-the-board regulations (Western Morning News, 12th April 2015). There is regional disparity among media sources in their reporting on this issue, which suggests that the east coast of England is experiencing more problems than the west of the country.
- The introduction of Marine Protected Areas (MPA) has been reported in media sources. It is viewed as posing a threat to inshore fishers in terms of their ability to access fishing grounds and it is suggested that this is a major reason why many fishers do not support their introduction (Wales Online, 25th April 2013, Graham Henry). That said, there is disparity in the discourse regarding the efficiency of MPAs to protect biodiversity and thus achieve their primary purpose. From the media analysis, reports suggest that some inshore fishers feel let down by government policy on this issue and more generally. They feel a sense of abandonment (The Scotsman, 6th July 2015, Alistair Munro) against the scientific lobby who argue for MPA. Of the 127 proposed sites for conservation zones, only 27 have been implemented. This represents less than a quarter of those originally proposed (The Guardian, 21st November 2013, Damian Carrington). However, some are questioning the adequacy of those that have been introduced as they do not ban the use of certain fishing equipment, which could be the cause of much of the damage (The Ecologist, 18th July 2014, Jason Hall-Spencer).
- Land obligations and fish size: how can the inshore fishers benefit? The **landing obligation** or 'discard ban' is part of the new Common Fisheries Policy. It came into force for pelagic species in January 2015 and for demersal species obligations will be applicable and implemented between 2016 and 2019. The discard ban applies to all quota species – both targeted and by-catch – and to all UK fishing vessels catching them (Fishing Focus, Autumn 2014, Issue 35). This reform has been welcomed by ecologists. For instance, the Fish Fight campaign (www.fishfight.net), which was launched in 2010 and fronted by celebrity chef Hugh Fearnley-Whittingstall, reported that up to 90% of catches were being thrown back into the sea. However, the NFFO chief argued that it might be difficult to implement this policy on a practical fishery-by-fishery basis (The Ecologist, 2013, Rosie Magudia). The onus is now on the fishers to adapt to the regulation and to innovate to find new ways of fishing, so as not to fall foul of the new discards ban (The Huffington Post, 10th March 2014).

Balancing discard bans and quotas is a key theme identified in the media sources. In a recent blog, NEF highlights the benefits of selective fishing, which they view as welcome news for many working fishers around England's coast. The reason, they suggest, is related to regulations and quotas. Summarising the current situation the NEF blog comments that "[i]n most instances the

fish are thrown overboard to avoid breaking the law – not because they are unwanted. This is because fishers do not have enough quota (the legal right to catch a particular species in allocated amounts) to land the fish and is a particular problem for inshore, small scale fisheries. This is known as ‘regulatory discarding’ and it puts access to quota at the centre of the problem” (NEF, 21st October 2015, Chris Williams). The problem was that the majority of inshore fishers operate in mixed fisheries and do not have the quota to enable them to fish for the variety of species they catch, making the catch illegal if they do not discard. However, the European Commission will be increasing quotas to deal with the fact that fish that was previously discarded will now have to be counted against quota. The suggested good news for inshore fishers, following the Fisheries Minister, George Eustice’s announcement, is that the government is committed to “introducing new flexibilities to help fishers manage their quotas and [...] giving more quota to the under 10 metre fleet.” (NEF, 21st October 2015, Chris Williams) The first 100 tonnes of any additional quota received, and 10% of anything more obtained, will be allocated to the English inshore fleet.

Indeed, some opinions reported in the media sampled suggested that in the current context, in order to achieve enough income, fishers need to be flexible and to be prepared to catch what they can when they can, rather than relying on one or two species (BBC Two, February 2012, The Fisherman’s Apprentice with Monty Halls). Previous success stories, such as that of a fisherman in Cornwall who adapted his catches and sales to what he was seeing out in the sea, an abundance of sardines, and was able to turn it into a profitable business (Western Morning News, 1st April 2014, Simon Parker), suggests that the discard ban combined with a better allocation of quota could be of some benefit to inshore fishers.

2.4 The dairy sector

The milk price that farmers receive (market condition) and the abolition of the milk quota system (regulatory condition) were the two main issues discussed in the media in relation to the dairy sector, alongside price volatility already discussed above.

- The milk price that farmers receive is often discussed in terms of the costs of production and the structure of the milk supply chain. The milk market, particularly liquid milk, is dominated by retailers through which as much as 80% of milk produced is sold (The Guardian, Food and Drink industry, 11th August 2015). The issue of milk price has been an on-going debate in the regional media. It received particular attention in the national media in 2015 when several protests organised by dairy farmers outside targeted supermarkets/processors were reported. The Guardian (11th August 2015), reported that the protests were in response to an unprecedented drop of 25% in the farm-gate price that dairy farmers received between 2014 and 2015. Figures from the Department of Food and Rural Affairs (Defra) were used in a BBC news item at the time which showed that in June 2015 farmers were receiving on average 23.66p/litre (BBC News Business, 11th August 2015). With cost of production at 30p per litre of milk, dairy farmers in various reports argued that operational costs were currently unsustainable and were driving many farms out of business (The Guardian, 12th, 14th January 2015; Sustainable Food Trust, Farming, 9th October 2015; Farmers Weekly, 3rd February 2016).

The media analysis identified two opposing camps in relation to the milk price crisis: dairy farmers and supermarkets. Dairy farmers were depicted as victims caught in the midst of a

supermarket 'price war'. In August 2015, the National Farmers' Union (NFU) argued in a BBC Business online article that "a supermarket price war, which has seen a 2.3-litre bottle of milk sell for 88p, has devalued the product in the eyes of the public, "purely to get customers through the door"".(BBC News, Business, 11th August 2015). In response, supermarkets argued that the low prices were a result of the Russian ban on European dairy products and the consequent oversupply in the market. Commercial confidentiality means that access to information about retailer and processor profit margins are difficult to access, which adds to the complexity of negotiations (BBC News, 11th August 2015).

However, as noted in several media reports, some retailers now buy milk directly from farmers. For instance, "Waitrose, Marks & Spencer, Tesco, Sainsbury's and the Co-op have established schemes which ensure farmers are paid a price above the average cost of production for fresh milk." (BBC News, 11th August 2015; NFU Online, 23rd January 2015). While some farmers benefit from these schemes, the majority of farmers are not aligned to supermarket contracts and are thus vulnerable to market fluctuations and price volatility. This raises several questions regarding **strategies** that farmers adopt to manage risks related to market uncertainty. Media reports suggest two pathways are commonly adopted by farmers who decide to stay in business: 1) increasingly production to benefit from economies of scale (BBC News, 1st April 2015, Claire Marshall); and 2) specialisation into the production of value-added products (Farmers Weekly, 9th April 2015, Charlie Taverner).

Producer organisations argued (Farmers Guardian, 8th June 2015), however, that these strategies, although useful for some, do not directly address the basic problem of price fluctuations. Interestingly, contracts, although key to ensure a farmer can secure a stable price for their production (Farmers Guardian, 20th February 2016, Olivia Midgley), are not much covered in the general media, and are discussed instead more frequently in the specialised media. Articles from the farming industry have also started to mention dairy futures market (Farmers Weekly, 15th June 2015, Sarah Alderton) as a possible strategy to provide "some security to the industry". However, the topic is relatively new and received very limited attention in the public sphere and national media sources. A 2015 article in Farmers Weekly reported a range of contrasting views about the possibility of a UK futures milk market. For example, Peter Isaac, head of feed sales for Mole Valley Farmers commented at a Total Dairy Seminar event that "If it's another way to market milk and give a guaranteed price then I think it's a good thing. It could help give some security to the industry". In contrast, another participant at the seminar argued that "A futures market would face massive viability, regulatory and access issues. It's unlikely it will come and needs a more pragmatic solution." Another participant stated that "[w]ithout a [Milk Marketing Board] MMB the British milk industry and small scale dairy farmers are doomed" (Farmers Weekly, 15th June 2015, Sarah Alderton).

- The abolition of the European milk quota system in April 2015 has been a primary issue discussed in the media. Media sources suggest that the abolition of milk quota, in place for 30 years, has propelled the UK dairy sector into a new open market, in which international competitors like Australia and the United States have been operating in for two decades or more. While some European countries such as Germany the Republic of Ireland and the Netherlands have reportedly been preparing for this new era of market deregulation by increasing production, the UK dairy sector, some reports suggest, is lagging behind (BBC News, 1st April 2015, Claire Marshall). This assessment is understandable but as other articles note UK dairy has been under

its quota target in recent years and the industry operates in a very different environment to, for example, the Republic of Ireland, which has had strong policy support and encouragement to increase production post-milk quota.

The reason for milk quota removal was to enable EU dairy businesses to “compete with international rivals in supplying fast-growing markets in Asia and Africa” (BBC News, 1st April 2015). Expectations were that demand would grow in parallel with a degree of optimism in the EU dairy sector regarding likely growth projections (Farming Life, 20th April 2016, Myles Patton and Siyi Feng). However, the Russian ban on imports of European products and the withdrawal of China from the powdered milk market were identified as two international events which subsequently pushed prices down and have challenged the industry (Farming Life, 20th April 2016, Myles Patton and Siyi Feng).

It was clear from the media articles analysed that the impacts of changing market and regulatory conditions on farmers’ sustainability are still difficult to predict. However, many communications predict further volatility and instability for producers. For example, the European Milk Board expects “chronic price collapses” and predicts that the “next crisis is on its way” (Express, 1st April 2015, Batchelor Tom).

There were two diverging sets of opinions in the media regarding the impact of the abolition of milk quotas. Media reports suggest that many small dairy farmers fear that only larger businesses will benefit from the end of the quota system, given predicted further drops in the farm-gate liquid milk due to oversupply in the market. For some the free market reality is difficult to accept and some call for more regulation. For example, a BBC News article of 1st April 2015, reported comments from Somerset dairy farmer, James Hole, who argued that: “All they are going to end up doing is create huge milk pools coming out of Europe...Long term there will probably have to be another form of capping. I can't see how they can just make it a free-for-all.” In the same article, NFU Dairy Board chairman, Rob Harrison, argued that the abolition of milk quota “could push farmgate milk prices down further in the EU and stall any recovery in the dairy markets” (BBC News, 1st April 2015, Claire Marshall).

However, a European Commission representative argued that “[d]airy farmers often struggle with price volatility” and “quotas have not made their lives easier in that respect.” (BBC News, 1st April 2015, Claire Marshall) In similar vein, Judith Bryans, Chief Executive of Dairy UK, an association that represents milk companies in Britain, argued that quotas have been a barrier to the competitiveness of the UK dairy sector. As she put it, “[a]lthough quotas may have been considered as an appropriate response at the time of their introduction, they also held back the development of a truly efficient and competitive European dairy industry over the last thirty years.” (Express, 1st April 2015, Batchelor Tom). In the same article, the European Dairy Association, which represents the interests of milk processors in the EU, reported in favour of ending the quota system, suggesting that it “will lower the administrative burden on all levels” (Express, 1st April 2015, Batchelor Tom). In fact, as an article in Farmers Forum argued, farmers with low production costs who are prepared for the competition have been welcoming this new phase of deregulation (Farmers Forum, 11th May 2015, Melanie Epp).

Whether for or against market deregulation and quota abolition, most experts expect “the Irish Republic, the Netherlands and Germany to increase production sharply” (Express, 1st April 2015,

Batchelor Tom) and agree too that such increases will have an impact on the UK milk price and by extension dairy farmers' incomes. According to the Promar 2020 Dairy report, now that milk quotas have ended, UK dairy farms will gradually specialise as either high-input or extensive-grazing systems. Furthermore, it is expected that "efficient farmers" would try to match their production with their milk buyers' needs and thus "mixed systems could become less popular." (BBC News, 9th April 2015, Charlie Taverner). This study's conclusion suggests that the deregulation of milk markets will give rise to further differentiation between those producers who are market sensitive, large scale and aligned with producing for the liquid milk commodity market and those differentiate and/or specialize to survive.

3 Brexit and the UK agri-food sector

3.1 Brexit: introduction

On 23rd June 2016 the British public voted in a referendum to decide whether to remain or leave the European Union. The results were narrowly but clearly in favour of leaving the EU (52% / 48%). In the context of this study, the majority of UK farmers and fishers voted to leave the EU, especially older voters from both sectors. The UK government confirmed that the decision will lead to the exit of Britain from the EU (Brexit), of which it has been a member since joining in 1973. Brexit will likely provoke major changes on all sectors of the UK economy and on UK citizens' lifestyle. Agriculture and food are likely to be particularly affected by the changes that Brexit will introduce (Lang 2016).

Currently, it is difficult to foresee the extent of the impact that Brexit will have on the UK agri-food sector, in that at the time of writing this report the negotiations are still at a very early stage and the UK will officially remain an EU Member State until 29th March 2019. Article 50 of the Lisbon Treaty (the official procedure for leaving the EU) was triggered by the UK Government on 29th March 2017 initiating a two-year transitional period of intense negotiations and decision making about the details and terms on which the UK leaves the EU block. Over 12 thousand EU laws, regulations and statutory instruments will need to be replaced or renegotiated (Lang 2016).

The outcome of the negotiations will significantly shape the future UK agri-food sector. Although details of Brexit are continually emerging, it is foreseen that the following five areas are likely be affected (AgraFacts 2016b):

- policies and income subsidies;
- markets and trade;
- access to migrant labour;
- farm regulations and practices; and
- fisheries' regulations and practices.

Each area is discussed in more detail below. To understand the potential impact that Brexit can have in terms of **agricultural policies and income subsidies** it is important to look first at what the UK is renouncing. Agriculture is the sector that receives the most EU public support. The CAP is a major component of the EU budget, ranging from 70% of the total budget in the 1980s to 40% in the 2010s (Helm 2016). The CAP has been designed to achieve both economic and social objectives, safeguarding the interests of producers and consumers (Article 39 TFEU). Its specific objectives are:

- To increase agricultural productivity, promote technical progress and ensure the optimum use of production factors, in particular labour;
- To ensure a fair standard of living for farmers;
- To stabilise markets;
- To ensure the availability of supplies; and
- To ensure reasonable prices for consumers.

According to these objectives, the current support provided by the CAP is structured as follows (Watts *et al.* 2016):

- Pillar 1. Direct payments decoupled from production to help stabilise farmers' incomes against volatile markets and unpredictable weather conditions. Direct payments are linked to safety, environmental and animal welfare standards;
- Pillar 2. Co-financing of projects on farm investment and modernisation, young farmers, agri-environment measures, organic conversion, agri-tourism, village renewal, broadband in rural areas; and
- Market support measures against failure of normal markets.

CAP support to UK farmers is significant. In 2015, the Single Farm Payment (SFP) formed 55% of farm income (FBS). With Brexit, the UK will lose about €3.5 billion per year of farm subsidies. Removing these subsidies would seriously undermine the competitiveness of British agriculture, especially because the countries remaining in the EU will continue to be highly subsidised by the CAP (Helm 2016). Moreover, because decoupled payments are unrelated to production but are linked to land area, they are capitalised in terms of land prices. Therefore, removing Pillar I payments can reduce land prices and rents to tenant farmers, potentially affecting the wealth of landowners and farms' access to credit (Helm 2016; Watts *et al.* 2016).

However, in the short term no major changes are expected to subsidies. The current round of CAP funding is in place until 2020, and on August 13th 2016 the UK Treasury pledged to honour the level of direct subsidies, agri-environment payments, research and rural development grants until 2020, covering any funding gap after the UK leaves the EU (AgraFacts 2016b). The issue of subsidy will therefore arise more concretely after 2020, as the UK Government has so far not made clear their plans for subsidy support beyond this point. By 2020 the British Government will likely have put in place a new policy in place of the CAP. Supporters of the leave campaign argued that once the UK leaves the EU it will be freed of the constraints of the CAP and with the repatriation of the UK's contribution to the EU budget, policymakers will have a blank sheet of paper in terms of designing new food, farm and environmental policies best suited to British circumstances (Helm 2016).

Given the current inefficiencies of the CAP (and of the CFP), there are concrete opportunities for the UK to improve its agricultural, fisheries and environmental policies. However, it is unlikely that policymakers will have the opportunity of designing a new policy from scratch, because they will work under constraints, including budget limits and political pressure from former EU partners, the devolved administrations (i.e. Scotland, Wales and Northern Ireland) and stakeholder groups (Swinbank 2016). Moreover, timing is not favourable. The next reform of the CAP is due in 2020, as well as the negotiation of the next Multiannual Financial Framework (Watts *et al.* 2016). New British agricultural and food policies will therefore coincide with a period of significant change in terms of EU policy, making it even more difficult for policymakers to make deals and to predict the potential outcomes of their new policies.

In terms of **trade**, large impacts on prices, costs, production and consumption are expected from changes in trade-related policy (Buckwell 2016). The consequences of the Brexit vote will largely depend on the outcome of future trade agreements. Brexit has already had an immediate trade

impact due to the change in exchange rates with the rest of the world. The current drop in value of the sterling means that the UK, which imports 30% of its food, is paying more for the same amount of food imported (Lang 2016). The UK government has repeatedly stressed that it will seek to maintain full access to the EU's single market, but is also insisting on limiting the free movement of EU citizens. From an EU point of view, access to the single market goes hand in hand with the free movement of people. Therefore, trade restrictions are likely to be imposed on the UK if it does not agree to the free movement of people (AgraFacts 2016b). If the UK succeeds in negotiating a free trade agreement with the EU, which avoids the reintroduction of tariffs on agri-food trade, trade costs are still likely to rise. Additional trade costs are likely due to: greater administrative paperwork; requirements to prove the UK origin of products with duty exemption; sanitary and phytosanitary inspections; greater delays at cross-channel ports; different labelling, packaging, food additive and food composition standards (Matthews 2016).

Increases in trade costs can lower producer prices but increase consumer prices, creating a price wedge and social inequalities (Buckwell 2016). Abreau (2013) estimated that the total amount of costs in preferential trade agreements can be equivalent to a 5% ad valorem tariff on trade flows in both directions (Matthews 2016). In other words, it is unlikely that any future UK-EU trade agreement will be as profitable as being a member of the EU. As well as the EU, the UK will also have to start trade talks with other countries around the world. As well as tariff levels, British farmers will need to be protected from lower animal welfare and transparency rules in the rest of the world (Helm 2016). In this respect, it is assumed that the UK will seek to join the World Trade Organisation (WTO) and keep its international obligations. This means that any support from a future British agricultural policy must ensure compliance with WTO rules, adding a further constraint to the decisions of UK policy makers (Watts *et al.* 2016).

A third major issue brought up by Brexit concerns **free movement of migrant labour** from the EU and access to skilled labour. A number of sectors of UK agriculture and food processing rely heavily on foreign-born labour. Horticulture is probably the most reliant, but other sectors will also be impacted (e.g. dairy). In 2013, 15% of the UK farm labour force was seasonal and 38% of labour in the UK food manufacturing sector was foreign-born (Lang 2016). Preventing the free movement of labour is likely to therefore have major impacts on the UK's food system.

In terms of **farm regulations and practices**, exit campaigners argued that once outside the EU the UK could relax its farming rules, increase access to new technologies, such as genetically modified crops, and avoid the ban on key agrochemicals like glyphosate, azoles and neonicotinoids (AgraFacts 2016b; Matthews 2016). However, the level of access to the single market will determine how much the UK will have to continue to meet EU farming and environmental rules (AgraFacts 2016b). For example, the type and quantity of agrochemicals allowed on apples and pears by the EU can affect pesticide use decisions of British producers; if the UK decides to authorise the cultivation of GM crops farmers need to adopt segregation and coexistence rules for those GM varieties that are not authorised in the EU. The availability of innovative technologies to the UK agri-food system may also be limited by a reduction in research funds. The UK has been a significant beneficiary of European research funds, particularly agri-food research programmes, such as Horizon 2020. The UK is the second highest recipient of EU research funds after Germany. The EU research funding system is the richest in the world, with a total of €80 billion of funding in the current 7 years research programme. Any

reduction in the UK's access to EU research funds can potentially affect domestic agri-food research and the sector more generally.

The discussion so far has related to the agri-food sector generally. Some specific comments are now provided in relation to the two sectors analysed in the UK: inshore fisheries (section 3.2) and dairy farming (section 3.3); see also section 4.7 and section 5.6.

3.2 Brexit: fisheries, including inshore fisheries

Fisheries are quite distinctive when compared with the rest of the agri-food sector and in the EU are governed by the Common Fisheries Policy (CFP), rather than the CAP. As with so many of the issues surrounding Brexit there is a great deal of uncertainty in relation to fisheries, but the following issues are some of the main ones that need to be borne in mind. They are taken from two key publications. The first is a House of Commons Library Briefing paper entitled *Brexit: What next for UK fisheries?* (House of Commons Library 2017); the second is a publication by the House of Lords European Union Committee entitled *Brexit: fisheries* (House of Lords 2016). In addition to these insights into how Brexit might affect fisheries, generally, section 4.7 of this report provides the perspective of those inshore fishers in Cornwall who were engaged as part of the Sufisa research project. This includes the development of a number of different scenarios, dependent on the Brexit approach taken.

By and large, most fishers voted for Brexit, seeing it as an opportunity to take back control of UK waters. The following quotations are taken from a BBC radio four programme which was looking into fishing futures, and typify many of the comments made by fishers.

'A one in a 150 year opportunity'; 'A very mixed fishery' that makes a one size fit all approach almost impossible'; 'The CFP has been a disaster'; 'Our right to fish was given away'; 'I want us to control our own seas, which we can do with UNCLOS, but at the same time we are also legally bound to have regard for the historic fishing rights of others'; 'It is not a case of more fish being caught, but that the distribution needs to change'; 'Fishing around the UK is one of the most difficult places in the world to manage fisheries, in that there are so many people involved'; 'Brexit provides an opportunity to better manage our waters and marine environment'; 'How hard will the government really fight?'; 'We can't afford to miss this opportunity'. (BBC Radio 4 2017).

Figure 1. 'Fishing for leave'



Source: These images have been taken from: <http://ffl.org.uk/material/> Accessed 17.01.2017

The House of Lords report on Brexit cautions that: “The fishing industry represents a very small part of the UK’s GDP. Yet it is of great importance to many coastal communities across the UK”. This has made some in the industry nervous that fishers’ voices will not get heard in the negotiations, an accusation that was also made at the time the UK originally joined the EU. This point is strongly made in the House of Lords report: “Notwithstanding the comparatively small contribution of fisheries to the UK economy, the voices of the industry, the coastal communities that support, and thrive on, the industry, and its supply chains must be heard in the wider Brexit negotiations”. (House of Lords 2016, p. 4)

The CFP covers four main policy areas, each of which is likely to be affected by the Brexit negotiations. These four areas are: fisheries management; funding; market organisation; and environmental regulation. Each of these is now discussed in turn.

3.2.1 Fisheries management

“Withdrawing from the European Union will mean withdrawing from the CFP. But fish know nothing of political borders and most commercial fish stocks are shared between UK waters and those of other EU or European coastal states. Species of fish may spend different stages of their life cycles in different nations’ Exclusive Economic Zones (EEZs), and their spawning grounds may be in a different region from that in which they are caught when mature.” (House of Lords 2016, p.3)

Fisheries management is highly complex within the European environment. The Brexit negotiations will need to cover a range of different issues, as follows.

3.2.1.1 *Control over a greater area of sea*

Countries such as Norway and Iceland are responsible for fishing in their EEZ, up to 200 nautical miles from the coast. This is the norm under international law. This contrasts with the EU, where Member States share access to fishing grounds between 12-200 nautical miles from their coasts. In addition, the London Convention 1964 established rights for the vessels of certain countries to fish in the 6-12 nautical mile region, if they had 'habitually fished' in the same region between 1953 and 1962. Similarly, article 17 of the CFP framework regulation, EC No. 2371/2002 granted so-called 'grandfather rights', allowing access for certain member states to fish for certain species of fish in UK waters; in turn, the UK was granted access to the inshore waters of a number of other Member States. In 1983, the principle of Relative Stability was established, whereby it was agreed that fisheries and quotas in the EU EEZ would be shared on the basis of who was already fishing in those areas. The intention was to prevent any dramatic consequences for particular fisheries when the EU EEZ was introduced at that time. In retrospect, it has been argued that this disadvantaged the UK fishing sector, but a reluctance by Member States since then to renegotiate Relative Stability would suggest that negotiations in this area will be difficult.

In the event that the UK declares an EEZ independent from EU waters, the UK would be able to control access that all foreign vessels have to fish in UK waters. Should this happen, as an independent coastal state the UK would then be required under the UN Convention on the Law of the Sea to manage the living resources and fishing activities within its EEZ in a sustainable way; furthermore, they will be required to cooperate with adjacent coastal states to manage those stocks which are being shared with neighbours, as well as any 'straddling stocks' in order to minimise the risk of overfishing. (House of Lords 2016, p. 55).

3.2.1.2 *Renegotiating the UK's share of fish quotas*

Those campaigning for Brexit argued that the UK government would be able to represent itself in quota negotiations and achieve higher quotas for UK fishermen. However, others question the loss of the collective bargaining power of the EU in relation to countries such as Norway, Iceland and Russia.

Some argue that the ability to walk away from negotiations if the UK is not happy with its share of the quota is a strong bargaining position. Others argue that if the UK walks away from negotiations and unilaterally sets higher quotas for its fishers, the EU could respond harshly. Ultimately there appears to be significant uncertainty as to the implications of Brexit in relation to how much bargaining power the UK will have in fish quota negotiations.

In reality, the UK will need to co-operate with the EU after Brexit on quota settings, in that most of the commercial species are migratory and therefore cross EEZ boundaries. Indeed, such cooperation is enshrined in international law. The UN Agreement on Straddling Fish Stocks and Highly Migratory Fish Stocks and the UN Convention on the Law of the Sea in 1996, both of which the UK has ratified, require cooperation on both the conservation and management of fish stocks that straddle national jurisdictions.

The extent to which Brexit will lead to higher quotas for UK fishers of stocks that are shared with other countries will be a matter of negotiation. At present, the allocation of quotas to Member States is via the notion of Total Allowable Catches, which are ultimately political decisions, albeit informed by scientific advice. In this regard, the House of Lords (2016, p. 56) report cautions that

the UK government should resist the temptation to raise quotas above scientific recommendations, even if it has more autonomy to do so post-Brexit.

3.2.1.3 A new UK fisheries policy and management system

One of the potential benefits of Brexit, and something that is strongly endorsed in the case study specific data discussed under section 4.7, is the UK's ability to take more locally appropriate fisheries management decisions, rather than relying on a top-down, 'one size fits all' approach that has been decided in Brussels.

However, the House of Lords (2016, p. 56) report urges caution, in saying: "A new fisheries management regime within the UK will only be effective if there is a degree of alignment to, and co-operation with, neighbouring states. Such regional co-operation will necessitate co-ordinated objectives and similar management practices, without which the sustainability of shared stocks may be undermined. The UK should not discard the positive elements of the CFP that successive Governments have worked hard to achieve, such as sustainability and regional co-operation". In other words, in practice it is likely that the UK will develop a system that in large part reproduces what already happens under the CFP.

3.2.2 Funding

The UK was allocated €243.1 million in fisheries funding from 2014-2020. These funds are then matched by the UK government and can be used to help support sustainable fishing and coastal communities. These funds have been very important in a Cornish context, implemented by the Fisheries Local Action Group (FLAG). There is concern that these funds will not continue after Brexit. The EU also provides extensive scientific funding in relation to fisheries (and other areas of agri-food research), of which the UK is a major net beneficiary. Again there are questions as to whether this will continue post-Brexit.

3.2.3 Market organisation

As noted above, market access may well be negotiated in tandem with access to fisheries and quota allocation. In the absence of any kind of agreement, the UK may no longer have tariff-free access to the EU market. Tariffs are already applied on fish imports from non-EU countries such as Norway. This may also apply to the UK, or the UK may become dependent upon WTO tariff rules.

The European Parliament's fisheries committee has recently recommended that access to British fishing grounds should be linked to British access to EU markets in the forthcoming Brexit negotiations, saying that they are inseparable. While the EU Parliament will not actually be involved in the Brexit talks, the Parliament must eventually pass the agreed deal by a simple majority vote. Boats from other EU countries on average caught 58% of the fish and shellfish landed from UK waters between 2012-2014, worth more than £400 million a year. By contrast, UK Fishing boats fishing elsewhere in the EU waters caught fish worth about £100 million (Johnson 2017). It is important to acknowledge these tensions in that 80% of wild caught seafood is exported, with four of the top five destinations being in the EU. Indeed, the House of

Lords (2016, p. 56) report argues that: "Trade in fish and seafood is essential to the wider seafood industry, which relies heavily on importing raw goods at reduced or zero tariffs for domestic consumption, and on exporting domestic catches and production. Any disruptions to the current trading patterns could have profound effects on both the catching and processing sectors".

3.2.4 Interaction with EU environmental laws

Protection of the marine environment in the UK is already significantly dependent upon EU legislation, such as the Birds and Habitats Directives, which have made an important contribution to the creation of a network of marine protected areas around the UK. 50% of the UK's MPA network was set up under EU laws. European Marine Sites currently cover 12% of UK seas. The UK government has designated 50 Marine Conservation Zones (MCZs) since 2013 under the Marine and Coastal Access Act. The laws governing MCZs are weaker than those for EMS, in terms of protection from damaging activities such as developers, fishers or heavy industries. Protection of the conservation features within EMS has so far been upheld by the EU Court of Justice. After the UK leaves the EU, this will no longer be the case. The designation of a third and final tranche of domestic MCZs within UK waters (up to a further 50 sites) has been put on hold until the implications of Brexit are fully thought through (MPA News 2017).

3.2.5 In conclusion

"The vote to leave the European Union, and with it the Common Fisheries Policy, has raised expectations for the future of fisheries policy that may be hard to deliver. In withdrawing from the EU, the UK will be able to develop a domestic fisheries policy and control fishing activity within its EEZ. However, the majority of commercial fish stocks in UK waters are shared with other states, rendering continued co-operation with the EU and other neighbouring states crucial to the sustainability of those stocks." (House of Lords 2016, p. 58)

Fishing for Leave (FFL) is a pressure group that was set up in 2016 with the express aim of ensuring that the UK voted for Brexit, fervently believing that it was in the best interests of the UK fishing industry to do so. Their response to the report of House of Lords, quoted above, is typified by the following:

"If the EU were allowed unlimited access to our farmland, could take 58% of the animals, of which half were discarded dead at the side of the road and then sell them back to us, there would be national rage of biblical proportions but that is what is happening at sea". FFL are adamant that the UK should be allowed to take back exclusive access to its EEZ; furthermore that market access should not override reclaiming fisheries resources within the EEZ. FFL were furious that the House of Lords joined together trade and access, which FFL claim are two entirely separate things. FFL argue that British fishing was seen as 'expendable' during the UK's accession to the EEC, but that it should be given a higher consideration during the current/forthcoming Brexit negotiations" (Fishing for Leave 2016)

3.3 Brexit: dairy farming

Regarding the potential impacts of Brexit on the UK dairy sector, it is important to note that about 7% of UK dairy farm income comes from EU subsidies (Bellamy 2016), although this can vary and be much higher at times of poor milk price. Any reduction in subsidies can reduce the profitability of dairy farms and, as a consequence, can potentially affect UK milk production levels. The UK is 77% self-sufficient regarding milk, but over 85% of cheddar imports are from other EU countries, especially from Ireland. Any reduction of free access into the UK dairy market may allow UK producers to increase their domestic market share (Bellamy 2016). The lower value of the sterling may also stimulate exports, but the impact can be negative in terms of imports and the cost of acquisitions of UK companies by foreign investors can be lower (Bellamy 2016). Currently, UK companies already meet EU standards, but the UK dairy industry benefits from the free movement of foreign-born workers, and access to a skilled workforce is crucial (Dairy UK 2016).

In conclusion, the impact of Brexit on the UK agri-food sector will depend on future agreements between the UK and the EU and between the UK and other countries across the world. It will depend also on the details of a future British agricultural policy, especially in terms of farm income support. Details on these elements will not be finalised or available for 2-5 years and possibly even longer. The UK agri-food sector is currently in a period of transition. Farmers and fishers are operating in uncertain policy and market environments, with doubts around the security of their future income.

4 UK Case Study A: Inshore fishing sector, Cornwall, England

4.1 Case study introduction and context

The purpose of this case study is to investigate the nature of policy requirements, market imperfections and their implications for the resilience of the inshore fishing sector in Cornwall, England. It is based on the conceptual framework developed in WP 1, and aims to go beyond the relatively fragmented insights consolidated in WP 1 to produce a more comprehensive and holistic view of the conditions faced by inshore fishers and the strategies they employ to ensure their sustainability, resilience and continuation. It is one of two case studies being conducted within the UK, with the second case study examining milk producers in the county of Somerset. This second case study has its own section within the UK National report, but it will become clear that many of the issues faced by inshore fishers are also faced by milk producers. This is significant and a key benefit of conducting simultaneous investigations into these two different primary production sectors. The similarities will be highlighted where appropriate, as well as the distinctive nature of the responses, thereby having the potential to provide a valuable learning experience.

4.1.1 *Fishing in the UK*

In 2014, Greece had the highest number of fishing vessels in the EU (15,704), while the UK fleet was seventh with 6383 vessels, down 26% since 1996¹. Of these 6383 vessels, 5026 were under 10 m and 1357 were over 10 m. There were an estimated 11,845 fishermen in 2014, down 12 per cent since 2004. Of these, 5,367 were based in England, 850 in Wales, 4,796 in Scotland and 832 in Northern Ireland. Part-time fishermen accounted for 18 per cent of the total, the same proportion as a decade ago. In total, in 2014, UK vessels landed 756,000 tonnes of sea fish (including shellfish), 60% of which was landed in the UK and 40% abroad, with a total value of £861 million. In 2014, the UK imported 721,000 tonnes of fish, while exporting 499,000 tonnes, leaving a trade gap of 222,000 tonnes. Imports were highest for cod, tuna, shrimps, prawns and salmon; while the main exports were salmon, mackerel and herring. Imports into the UK were highest from China, Iceland, Denmark, Germany and Norway; while in terms of exports the largest amounts went to France, the Netherlands, Nigeria and the USA. In 2014, fishing accounted for 4.1 per cent of gross value added for the agriculture, hunting, forestry and fishing sector (at £426 million), down from 4.5 per cent in 2013, but up from 3.9 per cent in 2004. Consumer expenditure on fish rose in 2013 to £4.3 billion compared with £4.0 billion in 2012; while household expenditure on fish as a proportion of overall expenditure on food increased to 5.3 per cent (MMO 2015).

87% of all landings by the UK fleet in 2014 were by vessels which were members of a producer organisation. Over one third of UK vessels over 10 m in length were not members of a producer

¹ In large part, the reduction in vessel numbers is the result of a series of decommissioning exercises in 2001-2002, 2003, 2007 and 2008-2009, designed to reduce the capacity of UK fisheries and help ensure a sustainable future (MMO 2015).

organisation in 2014, meaning they had limited access to fishing quota and primarily targeted shellfish species which are not subject to quotas. Vessels under 10 m without producer organisation membership are part of what is known as the '10 metre and under pool'. They are responsible for relatively small quantities of demersal and pelagic species landings, with around 80% of their catch being shellfish, which typically gain higher than average prices (MMO 2015).

Figure 2 shows the distribution of the UK fishing fleet by administration port; Figure 3 shows the capacity of the fishing fleet by administration port; Figure 4 shows the landings into the top 20 UK ports by UK vessels by species type; and Figure 5 the distribution of the UK fishing fleet by administration port. In 2014 Newlyn had the largest number (614) of vessels in its administration, 87 per cent of which were of 10 metres and under in length. This high percentage of smaller boats is reflected in the relatively smaller gross tonnage of the boats involved, as well as the relatively larger number of fishermen involved.

Figure 2. Number of vessels by administration port, 2014

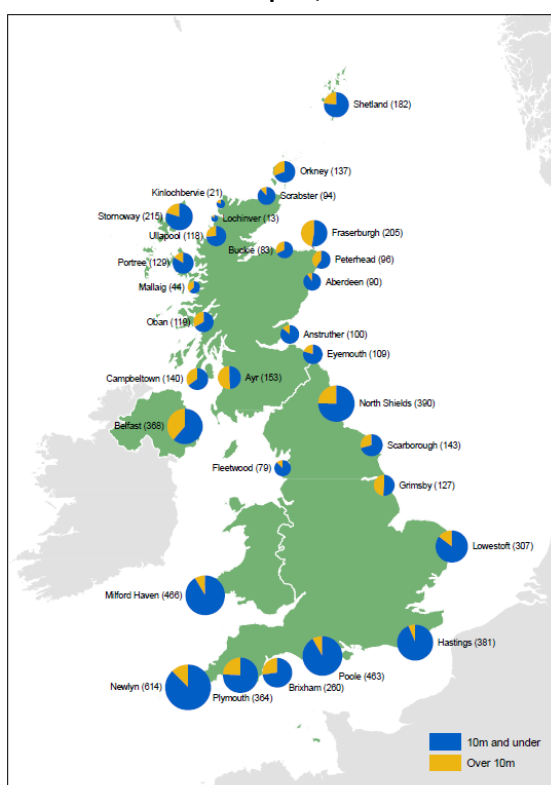
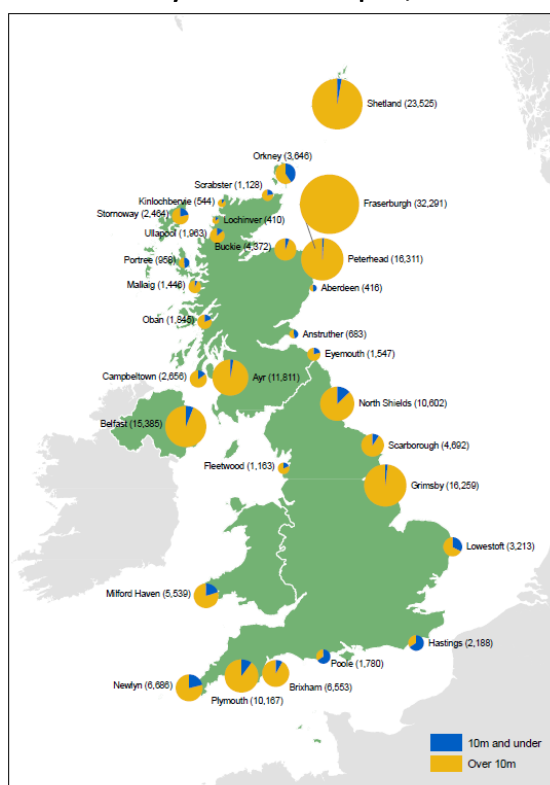


Figure 3. Capacity (gross tonnage) of fleet by administration port, 2014



Source: MMO (2015, p.34 & 17)

In terms of landings and value: “In 2014, Brixham was the port with the largest quantity of landings in England (12 thousand tonnes), followed very closely by Newlyn and Plymouth with 11 thousand tonnes each. The value of landings in Newlyn (£22 million) and Brixham (£21 million) were much higher than in Plymouth (£14 million). This is largely due to the different species landed in each port; Newlyn and Brixham receive much greater proportions of demersal fish and shellfish, which typically sell at higher prices per tonne than pelagic species, which constitute the majority of landings in Plymouth” (MMO 2015, p. 60).

Figure 4. Landings into the top 20 UK ports by UK vessels by species type, 2016

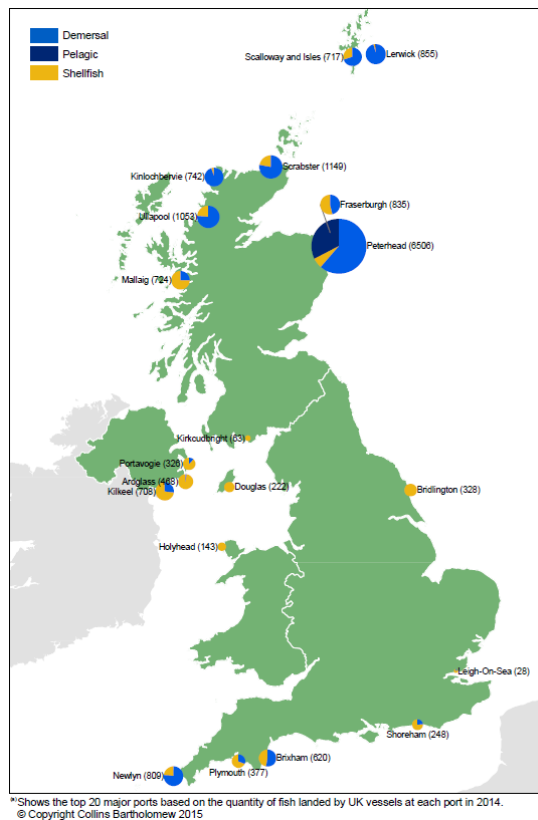
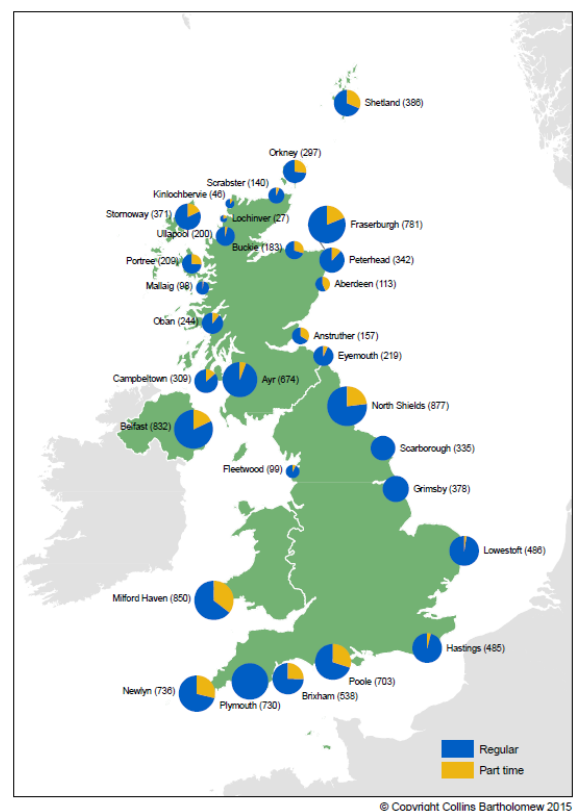


Figure 5. Number of fishers by administration port, 2014



Source: MMMO (2016, p.10 & p.44)

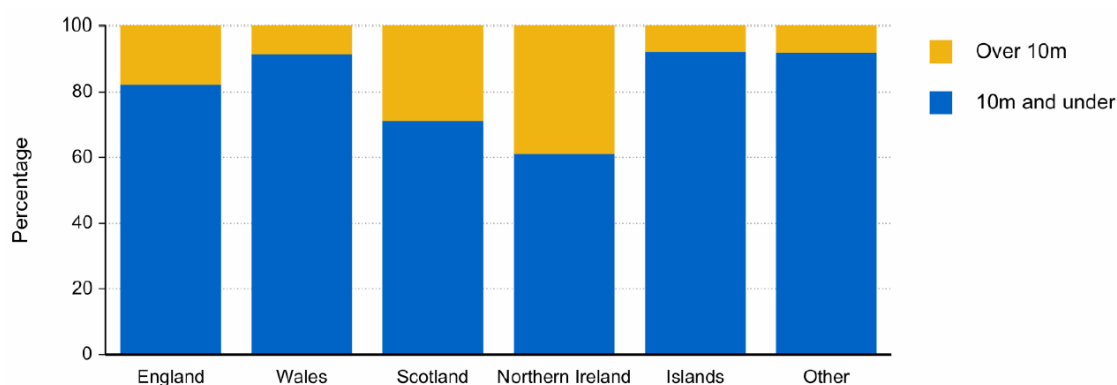
The focus of this case study is inshore fishing which involves boats that are less than 10 m long. Inshore boats in the UK are classified as follows (Seafish 2015):

- *Under 10 m demersal trawl/seine*: the number of these vessels has fallen by about 18% since 2005, reaching 195 units in 2014. More than 60% of their landing value consists of nephrops (53% of total catches) and sole (13% of total catches), but they also catch scallops, squid, shrimp, bass and whiting. Over the last ten years, the average annual operating profit per vessel of this kind was £12,800. Over the same period, the average annual operating profit per vessel increased by about 80%.
- *Under 10 m drift fixed net*: the number of these vessels has increased by about 720% since 2005, reaching 245 units in 2014. The majority of their landing value is represented by sole (25% of total catches) and bass (19% of total catches), but they also catch pollack, anglerfish and brown crab. Over the last ten years the average annual operating profit per vessel was about £12,300. Over the same period, the average annual operating profit per vessel increased by about 43%.
- *Under 10 m pots and traps*: the number of these vessels has increased by about 126% since 2005, reaching 1,020 units in 2014. These vessels are specialized in catching shellfish. The majority of their landing value is represented by lobsters (34% of total catches), brown crab (22% of total catches) and nephrops (16% of total catches), but they also catch whelks and velvet crab. Over the last ten years the average annual operating profit per vessel was about £11,600. Over the same period, the average annual operating profit per vessel increased by about 69%.

- *Under 10 m using hooks*: the number of these vessels has increased by about 326% since 2005, reaching 150 units in 2014. The majority of their landing value is represented by razor clam (31% of total catches), bass (22% of total catches) and scallops (17% of total catches), but they also catch whelks and velvet crab. Over the last ten years the average annual operating profit per vessel was about £9,800. Over the same period the average annual operating profit per vessel decreased by about 7%, suggesting that this method of inshore fishing is the least successful.

The remaining inshore vessels are classified as “inactive” or “low activity” under 10 meters, as they have average landings of less than £10,000 per year, which means they often operate at negative profit margin (Figure 6).

Figure 6. Percentage of vessels ‘10m & under’ & ‘>10m’ sectors by country, 2014



Source: MMO (2015, p.11)

Although some issues are common to all fishers within the UK, the inshore fleet faces particular issues, not least in terms of its continued existence and contribution to the socio-economic contexts/communities within which it operates. Specifically, the focus within this case study is on inshore fishing within the county of Cornwall, in that Cornwall represents one of the key areas where inshore fishing remains a key part of the rural community both economically and culturally. It is also facing a range of issues that are typically faced by primary producers across Europe, including climate change, globalisation and responding to a 'post-productivist society' in which there are a wide range of user groups with an interest in coastal areas. Symes *et al.* (2015, p. 247) describe these as 'wicked problems' that can best be examined and understood in terms of resilience theory.

4.1.2 An introduction to Cornwall

Cornwall forms the westernmost part of the south-west peninsula of the UK (see Figure 7). The population of the county is just over 530,000 people, with the city of Truro as its administrative centre. The county is noted for its long and varied coastline, extensive stretches of which are protected as Areas of Outstanding Natural Beauty. The north coast is exposed to the storms of the Atlantic Ocean and is typified by a rugged coastline, although there are also extensive sandy beaches that are important tourist destinations. By contrast, the south coast is more sheltered and there are a number of protected estuaries that have grown up as ports, such as Falmouth, which is the most important port in Cornwall and one of the largest natural harbours in the world.

Figure 7. Cornwall location map



Source: https://upload.wikimedia.org/wikipedia/commons/a/a3/Cornwall_outline_map_with_UK.png

Cornwall is one of the poorest parts of the UK in terms of per capita GDP. It has relatively low average earnings compared to the rest of the UK, as well as relatively high unemployment. A key factor in Cornwall's relatively low economic performance is that 88% of its businesses are micro-businesses, very often one or two man bands, that have proved very difficult to develop further (IF: Interviewee 4). At the same time, an influx of relatively wealthy retired people and second home owners has driven up house prices, whereby many local people struggle to live near their place of employment. The combination of these factors has led to a gradually increasing, but ageing, population as younger people have tended to leave the county in search of employment and further education, and older people have come to retire there.

Historically, both tin and china clay have been important to the local economy, as well as fishing and farming. Today, tourism is the most important industry, with 4.5 million visitors to the county every year. This represents about 25% of the county's GDP, despite Cornwall's geographical disadvantage of being relatively isolated from the main centres of population, industry and commerce. In 2011, Cornwall's wealth was a little over 60% of the EU average per capita. As such, the county is a European Convergence area, meaning that it has access to both ERDF and ESF funds².

Of particular interest to this case study are coastal communities that support the fishing industry. Phillipson and Symes (2015, p. 349) highlight that such communities show relatively high levels of economic deprivation as well as inactive people of working age. They go on to quote the Cornwall FLAG strategy, in demonstrating that "one in three people in the county as being touched in some way by the fishing industry, whether through ancillary, processing and tourism activities or through living in a coastal location that supports fishing"; furthermore, that the presence of a fishing industry is an important part of the tourism appeal of the Cornish coastal towns. As such, the continuation of the fishing industry within Cornwall is important to the county's future prosperity.

² Previously it had been an Objective 5b (1994-1999) and Objective 1 (2000-2006) area.

Phillipson and Symes (2015, pp. 349-350) describe how “Cornwall’s fishing activity is dispersed among some 50 or so ports, harbours and small coves along its long indented coastline with Newlyn hosting the largest concentration and ranked as the UK’s eighth largest port by volume of landings in 2010. With a fleet of 619 registered fishing vessels, of which almost 90 per cent are under 10 m in length, and 898 active fishermen of whom a quarter work part-time, the sector is diverse and versatile. Fishing activity ranges from beam trawling, scallop dredging, drift netting and long lining, to hand lining, crab and lobster potting. There are two official markets at Newlyn and Looe, though landings at many of the smaller harbours are usually handled by travelling merchants for onward sale, or sold direct to local outlets. A high proportion of the Cornish catch is exported to mainland Europe (mainly France and Spain), with little value added locally. Some development of domestic markets has taken place, including several added value initiatives (e.g., hand line caught mackerel, bass and pollack) as well as the supply of high quality fresh fish to high-end restaurants in Cornwall and beyond”.

There are three main auction markets for Cornish landed fish: Newlyn and Looe (both of which are within the county of Cornwall), and Plymouth which is just across the border in Devon. As Table 2 shows, both Newlyn and Plymouth are of significant importance within a UK context.

Table 2. Landing by UK vessels 2014

	Quantity ('000 tonnes)				Value (£ million)			
	Demersal	Pelagic	Shellfish	Total	Demersal	Pelagic	Shellfish	Total
England								
Brixham	4.3	2.4	5.0	11.6	11.1	0.8	9.0	21.0
Newlyn	6.8	2.3	2.2	11.3	17.2	0.8	4.0	22.1
Plymouth	2.2	6.3	2.7	11.1	5.9	2.8	5.0	13.7

Source: MMO (2015, p.6)

Crucially, the Cornish fishing industry is integral to the county's cultural and social fabric. It is estimated that the Cornish fishing industry employs approximately 3300 people, based on 900 active fishermen, plus an estimated 2.75 jobs on shore for every fisherman (when tourist jobs created as the direct result of fishing are also considered, it is suggested that the multiplier is 4:1 (Morrissey and O'Donoghue 2012)). While it is difficult to get hold of accurate figures, it is estimated that the total value of the seafood sector in Cornwall is in excess of £100 million. Perhaps more importantly, it also provides vital support to Cornwall’s £1.8bn tourism industry (Duchy Fish Quota Co 2016).

“Obviously it creates employment, but it is part of the fabric of Cornwall basically. Cornwall wouldn't be Cornwall if it didn't have fishing harbours and there wouldn't be fishing harbours if there wasn't a fishing fleet. I saw an interesting statistic in a tourist publication about three or four years ago and it really surprised me. They were obviously canvassing opinions of visitors and the major reason people came to visit Cornwall was to visit the fishing harbours, not the beaches, not surfing, it was to visit the great fishing harbours. The top reason they visited, you know, I would bare my boots, that it was they'd come for the beaches; not the case apparently.” (IF: Interviewee 1)

Most of the UK-registered fishing vessels in Cornwall are registered either with the South Western Fish Producers' Organisation (SWFPO) or the Cornish Fish Producers' Organisation (CFPO). The principal landing port for SWFPO vessels is Brixham in Devon and for CFPO vessels Newlyn in Cornwall. There are just over 200 vessels in the CFPO, of which 80 are 10m or under in length (i.e. inshore vessels); the SWFPO has about 70 vessels, of which eight are 10m or under. The inclusion of 80 inshore vessels in the membership of CFPO is unique within the UK (Phillipson and Symes 2015). The boats within the CFPO range from a 5 m single-handed cove boat, up to a 38 m beam trawler, and they use a diverse range of fishing techniques that include: trawling, beam trawling, crab/lobster potting, gill-netting, long lining, drift-netting, scallop dredging, ring-netting and hand lining. The CFPO aims to manage quota on behalf of its members (only those boats in the over 10 m sector; quota in the under 10 m sector is managed by the Marine Management Organisation); to increase the unit value of its members' catches; and to represent the views and opinions of their members (CFPO 2016).

4.1.2.1 Inshore fishing in Cornwall

This case study is based on the 'inshore fishing sector in Cornwall'; however, it is important to clarify what is understood by 'inshore fishing'. In the first instance, it can be defined as boats that are under 10 m in length and managed by the Marine Management Organisation (MMO). But that is only part of the story. In general, the inshore fleet will fish within six miles of the shore, although some of the more powerful vessels may go out further than that. Indeed there is legislation that limits the size of boats that can fish within six miles of the shore, although some boats that are larger than 10 m have historic rights to fish inside the six mile limit. Within Cornwall and the CFPO membership larger beam trawlers are unable to fish inside the six mile limit, but smaller beam trawlers are allowed if they are using four meter beams. Scallop dredging within the six mile limit is also heavily constrained (IF: Interviewee 1). No foreign vessels are allowed to fish within the six mile limit, although some EU countries can fish between 6-12 n miles as a result of negotiations at the time the UK joined the EU in the early 1970s³. There is something called the Rainbow Chart which itemises which Member States have access to the UK's 6 n mile limit, which changes around the coast. In the North Sea it is predominantly German and Dutch boats; whereas in Cornwall it is French and Belgian boats, which can be quite large trawlers. There is no access for Spanish boats, in that they were not members of the EU at the time the negotiations on access were held (IF: Interviewee 3). The following quote gives an indication of the range of boats that are classified as under 10 m, and hence form the focus of this case study.

"You get different sorts of under 10 m boat. You get the 'rule beaters' which are quite powerful, they have plenty of gear, they have a lot more options, and then you get your older, smaller type that aren't a particular threat to any individual fishery. The beauty of those is their versatility. Because they can't travel very far, one day they might be fishing for herring, then they might do a bit of spider crab, then they will go and do something else, and they can make use of what is there and available. In other words, flexibility has always been key to their survival. Part of this is being able to respond to what fish are available at any one time" (IF: Interviewee 13).

³ The London Fisheries Convention 1964 was central to this, resulting in the notion of 'Relative Stability'.

This flexibility has been significantly curtailed by the recent capping of latent capacity (see section 4.2.2.3).

'Rule beaters' are boats that have been specifically built to be under 10 m in length, with many of these boats being 9.99 m in length. Fishers may have taken advantage of one of the various decommissioning schemes to sell their quota, boats and license, but there was nothing to stop them subsequently moving into the under 10 m fleet. They were paid to scrap a boat and took the decommissioning money, but then re-entered fishing effectively through the back door. Due to their high-level specification, they were able to catch the maximum amount they were allowed to every month under the 10 m quota, enabling them to quickly develop a strong catching track record. The result is that under 10 m boats vary enormously in terms of the value of fish they land. At one end of the spectrum it might be as little as £15,000 a year, whereas others might gross up to £200,000. (IF: Interviewee 13).

Proponents of inshore fishing (defined in terms of being under 10 m boats) argue that it is inherently more sustainable than offshore fishing, but this is not a view that is shared by everyone:

"We recognise that smaller boats operating close to shore probably do have a smaller environmental impact. But it's a bit over-simplified to say that all inshore fishing is good and all offshore fishing is bad because the offshore sector has vastly improved the situation by reducing capacity, reducing days at sea, bringing in escape panels in trawler nets, reducing the areas that trawling / scallop dredgers can go, and so on. So it's a bit naïve really just to say that we could just support inshore guys and no-one else, because the offshore guys are still going to be around and we need to work with them all really to make sure they're all having a more sustainable future." (IF: Interviewee 8).

Indeed, some people argue that it is critical to have a mixed fleet, in that to some extent the larger boats can help subsidise the onshore infrastructure for the smaller, under 10 m boats, as well as maximise the use of quota and hence fish caught (see for example section 4.3.1 on access to markets).

"The small boats are an important part of the fleet. It is a mixed fishery out there and the best thing to catch the fish is a diverse fleet. A mixture of very small boats to quite large boats and everything in between. I think it is that diversity that enables us to survive" (IF: Interviewee 13).

The structure of this case study report is as follows. Section 4.2 examines the policy and regulatory conditions that impact upon inshore fisheries. This includes a sub-section on the Common Fisheries Policy (CFP), as well how the inshore fishing industry seeks to ensure its resilience and continuation. Section 4.3 then examines the market conditions as they affect inshore fisheries, drawing out the importance of access to markets as well as certification schemes. Section 4.4 then draws out the key CSP that are faced by inshore fishers, while section 4.5 identifies the key strategies adopted by inshore fishers and their impact on performance and resilience. The issues identified within sections 4.4 and 4.5 were subsequently examined further within Task 2.3 (focus groups and workshops), the results of which are reported within section

4.6. The case study report on the inshore fishing sector in Cornwall then concludes with an analysis of the implications of Brexit for the sector, set out in section 4.7.

4.2 Policy and regulatory conditions

4.2.1 Introduction to the Common Fisheries Policy

Fishing is an economic activity based on labour, capital and fish stocks. In the same way that land is for farmers, fish stocks are a limited resource, potentially undermined and drastically eroded by overcapitalization (in terms of the overcapacity of fleets in relation to natural fish stocks). As Frost and Andersen (2006) highlight, the overcapitalization problem is identical to that of the overexploitation of land. Rational fishers will, collectively, have an incentive to invest in capital up a point that avoids the over-exploitation of fish stocks, but this will not necessarily be at a level that maximises profit potential. Collectively fishers benefit from policies that rule the fleets' capacity: the number of vessels, gross tonnage and engine power (hence the licenses for approved vessels to fish); as well as the management of the natural resource (hence total allowable catches, quotas, the management of time spent at sea, and other technical measures).

The combination of restrictive licensing, individual vessel quotas, days at sea allocation and catch composition rules significantly reduce the flexibility of fishing operations that might otherwise enable individual fishers to adapt to changing conditions. Decisions on what, where, when and how to fish are now very tightly circumscribed, affecting both short-term and longer-term business planning (Symes *et al.* 2015).

The challenge of a Common Fisheries Policy is to manage a highly heterogeneous fisheries sector such as that of the EU. In other words, it is difficult to design optimal policies for multi-ecosystems, multi-species and multi-fleet fisheries (Frost and Andersen 2006).

4.2.2 Common Fisheries Policy

The Common Fisheries Policy (CFP) sets out the overarching regulatory conditions for all fishers within the EU. The CFP was first implemented in 1983 and has subsequently been reformed three times: in 1992, 2002 and 2013.

The key measure developed as part of the first CFP reform (1993-2002) was a series of vessel decommissioning schemes. One of the major problems of the 1992 regulation was the exclusion of stakeholders from the decision making process. The fact that fishers were not involved in the formulation of the CFP measures undermined its legitimacy and, ultimately, compliance with its policies (Gray and Hatchard 2003).

The second reform (2003-2012) focused on regional policies such as recovery and management plans. The 2002 Reform was claimed as a radical revision of the previous unsuccessful system (since 1993, several EU fish stocks had reached dangerously low levels), aiming for sustainable development in environmental, economic and social terms. In order to overcome the 1992 Reform problem of excluding stakeholders from the decision-making process, the 2002 Reform provided Regional Advisory Committees (RACs), which aimed to ensure better quality

regulations and greater compliance. However, the involvement of stakeholders in the decision making process was still limited, confined to the pre-decision phases of the CFP in which RACs had simply a consulting role (Gray and Hatchard 2003).

The 2002 Reform was characterized by strong centralization to the Fisheries Council, who set the quotas through a multiannual management plan, and to the European Commission (EC) who enforce the CFP regulations, strengthening its powers of monitoring and applying counter-measures against the non-compliant, such as quota cuts (Gray and Hatchard 2003). As part of monitoring and enforcement, the Community Fisheries Control Agency (CFCA) was established in 2003, subsequently renamed the European Fisheries Control Agency (EFCA).

Under the 2002 Reform, the way in which Total Allowable Catches (TACs) are discussed, designed and implemented has become a complex process involving the EC, the European Parliament (EP), the Scientific and Technical Committee of Fisheries (STECF), the Regional Advisory Committees (RACs), the ministers of each Member State, and other stakeholders. The volume of catches is determined, as follows: i) the EC makes a proposal for TACs on the basis of the scientific recommendations of the International Council for the Exploration of the Sea (ICES), RACs and the opinions of the STECF; ii) the Council approves it after arduous negotiations (Da Rocha *et al.* 2012).

The 2002 Reform also introduced a fleet policy in the form of fleet capacity (kW and gt) ceilings determined and agreed for each MS. While TACs and quotas were not subsidised, the fleet policy initially used subsidies to influence a fleet's capacity, especially concerning the modernization and construction of new vessels. However, since 2005 the granting of subsidies has been abolished for: the introduction of new capacity; the export of fishing vessels, or the establishment of joint enterprises with third countries; the modernization of the fleet, unless it concerns on-board safety measures, more selective fishing techniques or improvements to the quality of production. Overall, from 2005 the Member States' programmes were adapted to give priority to measures that will permanently reduce fishing capacity (kW and gt) (Frost and Andersen 2006).

Despite all the new measures approved and described above, the 2002 Reform was not considered an improvement with respect to overfishing and the depletion of fish stocks. Its failure is mainly in terms of the decision-making process, where the Council of Ministers is the one that ultimately decides TACs via a political process, often disregarding technical advice. In this respect, Khalilian *et al.* (2010) estimated that the TACs approved by the Council of Ministers are on average 48% higher than those advised by scientists.

In order to start planning a new CFP reform, the EC issued "The Green Paper for the Reform of the CAP and the Lisbon Treaty" in 2009. In this Green Paper the Commission identified five central structural failings of the CFP:

- A deep-rooted problem of fleet overcapacity.
- Insufficient guidance for decisions and implementation.
- A short-term focus on the management of natural resource.
- An insufficient responsibility of the industry.
- A lack in Member States of political will to ensure compliance.

Building on the Green Paper, the Commission issued a reform package in July 2011 that led to the latest reform of 2013, effective from January 2014. The 2013 Reform includes five main policies: the implementation of discard bans; Maximum Sustainable Yield as a key objective of fisheries management (which is now a key factor when determining the annual TAC); incentives to help develop the regionalisation of fisheries management; an increased emphasis on the social dimension/sustainability of fisheries; and the promotion of Transferable Fisheries Concessions (TFCs) (Le Floc'h *et al.* 2015, p. 375). In this respect, the intention is to give more responsibility to the fishing industry itself, in the hope that it will prove to be more effective at reducing overcapacity than a top-down regulatory approach.

4.2.2.1 Total Allowable Catches and quota

In 1983, as part of the European Union (EU) Common Fisheries Policy (CFP), a system of allocating Total Allowable Catches (TACs) for each EU member state was introduced, as a means of conserving fish stocks and sharing access to EU fisheries resources between member states (Duchy Fish Quota Co 2016). The TAC (corresponding to a particular harvesting rate), and technical measures (mainly mesh sizes and minimum landing sizes) based on scientific advice, involve most commercial fish stocks. In the EU, the TAC is set each year by the Council of Fisheries Ministers following negotiations on catch options that are provided by the Advisory Committee (ACOM) of the International Council for the Exploration of the Sea (ICES).

“ICES advice is based on stock assessments carried out at international working groups, where fishery scientists from the UK and the other nations compile fisheries data, biological data and survey data for use in fisheries science models. The age structure of a stock (the relative proportion of the different age groups) is largely determined by the fishing rate and by the numbers of young fish that enter the stock each year. When information on age structure is combined with data on landings, fishing effort, and the results of standardised stock surveys carried out by research vessels, the models are able to estimate the historical trend in fishing rate and stock abundance, up to the last full year of data. The assessment is then used to forecast the expected catch in an upcoming TAC year for a range of fishing rate options, taking into account the number of young fish that are expected to enter the stock, based either on survey data, or a recent historic average” (MMO 2015, p. 91).

Within the UK, the chief body responsible for assembling data on fisheries' stocks is CEFAS (The Centre for Environment, Fisheries and Aquaculture Science). With their head office in Lowestoft and Weymouth, they also have small, port-based offices in a variety of places, including Exeter and Newlyn. They are recognised as a world leader in marine science and technology, providing key data on UK fisheries that feed into the ICES deliberations (CEFAS 2016). Anecdotally, many of those involved in fishing in Cornwall are concerned that the science is always behind the reality, in that fish stocks fluctuate dramatically from season to season. There is little argument that fishing stocks need to be monitored, but the debate is how best to do this. There is limited funding to allow scientists to go out on boats to monitor stocks; at the same time not all fishermen are prepared to take scientists out on their boats, further compromising the ability to collect the most up-to-date data. The landings obligations and discard ban (discussed under section 4.2.2.4) will help provide more accurate data, in that previously undersized or over quota species were simply discarded, effectively removing them from analysis of the stock levels.

“Although local fishermen might say this stock is abundant, if you don't have any proof in terms of peer review scientific research, as a marine conservation organisation we can't really do a lot unfortunately. Local knowledge is great and it should inform detailed research, but sadly the funding for detailed research is a massive problem across the whole of Europe and in Cornwall it feels unfair from my perspective because our fishermen are often reporting healthy fish stocks and certainly the trend does appear to be on the up. People are landing more fish than they were a few years ago... In Cornwall, very few of our stocks are well studied, including some of our most important ones, economically: scallops, monkfish and lemon sole. We have very little research on those three which are really economically important... Without that information, we don't know how sustainable a fishery is” (IF: Interviewee 8).

Once a TAC is agreed for each stock and fishing area, it is allocated as national quotas to Member States in accordance with fixed percentages based on historic fishing rights. The MS are responsible for ensuring quotas are not overfished. When the entire quota is fished, the fishery has to close. Quotas can be exchanged between MS (MMO 2015, p. 91). It is clear that some MS have greater influence than others in the decision making process. Of all Member States, Denmark and the UK often receive the highest TACs in terms of volume above scientific advice. However, relative to the size of their TACs, Spain and Portugal exceed scientific advice by the greatest percentage. Greater transparency is required to determine what takes place during the closed door negotiations at the Council of Fisheries Ministers (Carpenter *et al.* 2016).

In the UK, management of quota has been largely devolved to Fisheries Producer Organisations (FPOs) since the 1980s⁴, at least for the over 10 m offshore vessels; furthermore, “until 1999 PO quota allocations were based upon average landings of member vessels over the previous three years, but from 1999 these historical rights were 'frozen' as Fixed Quoted Allocations (FQAs)” (Le Floch *et al.* 2015, p. 380). These allocations “are associated with individual fishing licences and normally move with the licence when it is transferred or aggregated onto another vessel” (Defra 2014, p. 9). POs are effectively fishermen's co-operatives and they have a considerable degree of flexibility in terms of how they manage quota amongst their members. UK fishermen can join a PO in any part of the country, although most have a strong regional identity, with potential members being attracted by the particular quota management system used in a PO (Le Floch *et al.* 2015). Vessel owners must notify UK Fisheries Administrations when transferring between FPOs for the purposes of quota management; furthermore, “a comprehensive database of membership of FPOs is maintained which augments the vessel data provided by the Register of Shipping and Seamen” (MMO 2015, p. 142).

The data collected from over 10 m vessels tends to be more arduous than for the under 10 m vessels. Data for the over 10 m vessels comes primarily from a fishing logbook, which captures data on fishing activity for each day of activity on a fishing trip. This includes details of the catch, the species caught, the quantity retained on board. Information is also collected on the fishing gear used. Supply of this logbook data is compulsory in respect of all species caught. Logbook data for UK vessels must be submitted within 48 hours of landing to UK authorities, including

⁴ More details on the management of quotas in the UK can be obtained from the MMO at: <https://www.gov.uk/government/publications/quota-management-rules>

landings into foreign ports. Two additional sources are used to collect data on the landings of over 10 m vessels: landing declarations and sales notes. Landing declarations provide information on the weight and presentation of fish landed by species. As with logbooks, they must be submitted to authorities within 48 hours of completion of the landing. Sales notes are required in terms of the first sale of fish and fisheries products; again they must be submitted to the UK Fisheries Administrations within 48 hours of sale by the registered buyer of the fish, except at designated auction centres where the registered seller has responsibility. Over time, the paper based system has been phased out with on-board vessel systems now being electronic-only reporting. A UK Electronic Reporting Systems Hub has been set up to collect, process and store these electronic data (MMO 2015, p. 143).

By contrast, there is no statutory requirement under either EU or national legislation for under 10 m vessels to declare their catches. Historically, data have been collected with the cooperation of the industry. This has included log sheets and landing declarations voluntarily supplied by fishermen, as well as sales notes and landing assessments collected from market sources and correspondents located in ports. Since September 2005, a scheme of registration for buyers and sellers of first sale fish has been introduced (as for the over 10 m vessels, above). In addition, during 2005 and 2006, new reporting requirements have been introduced for under 10 m vessels that require the completion of daily activity diaries that need to be submitted on a monthly basis. These are intended to supplement the sales notes data above (MMO 2015, p. 143). Nevertheless, the administrative burden is considerably greater for the over 10 m vessels, compared with the under 10 m vessels.

In the south-west of England, the Cornish Fish Producers' Organisation (CFPO) "has adopted what is commonly known as a 'pool-plus' system, whereby quota is pooled but individual vessels are able to supplement their monthly landings limits from the pool with quota leased privately from other vessels... Both the CFPO and, to a lesser extent, the South West Fish Producers' Organisation (SWFPO), have invested in FQAs in order to secure additional quota for the membership as a whole... Both POs assist their members with quota trading where required, for example by arranging exchanges ('swaps') with other UK POs via the MMO, but are not otherwise actively involved in quota trading" (Le Floc'h *et al.* 2015, p. 381). It is critical that the CFPO do manage any quota trading, in that they need to be able to demonstrate to the MMO how much quota their members are catching and therefore how much is available for the rest of the year (IF: Interviewee 1).

For vessels under 10 m there is a single block of quota allocation that reflects the aggregated activity of that part of the fleet during the 1994 to 1996 reference period. This approach was taken due to the lack of data for individual vessels during this reference period, with the result being that annual quota is allocated to the U10m fleet as a pool, rather than individually. For the most part, allocation of quotas for the inshore fishing fleet is managed directly by the national fisheries administration (Defra in the UK) and specifically its appointed agency, the Marine Management Organisation (MMO) (Le Floc'h *et al.* 2015), rather than the POs. The MMO set monthly catch limits for each quota species (which can vary significantly throughout the year). Having monthly catch limits means that in 'good' months a vessel's catch may be restricted, leading to the possibility of discards; it also means that vessels are unable to make up for any 'bad months' where catches of a particular species are lower than the allocated quota. Concern about this situation led Defra, in 2014, to set up a consultation about the possibility of allocating

Fixed Quota Allocations (FQAs) to individual licence holders in the U10m pool. FQAs would give U10m vessels more flexibility in terms of what they can catch over the course of the year and when they can catch it, potentially leading to higher value catches, fewer days at sea and less need to lease extra quota. At present, the higher catching U10m vessels often lease quota at the start of the year in case they land a valuable catch which would cause them to exceed their monthly catch limit (Defra 2014). This quota is leased from the over 10 m sector quota allocation, in that the under 10 m quota is non-tradable (IF: Interviewee 1).

There is no quota on crab or lobster at present, both of which are very important to the inshore fishing industry in Cornwall. However, there are concerns that more and more pots are being set out, potentially impacting the sustainability of this part of the fisheries sector. There are currently no restrictions apart from minimum landing sizes and the need to have a permit. In this respect, minimum landing sizes are particularly pertinent to lobsters. Originally this was set at 80 mm, but has gradually been increased to 90 mm⁵, in two stages. Initially, fishermen were resistant to this process, but have come to recognise that it is beneficial in that it gives lobsters the chance to breed and thereby maintain the viability of the sector. In addition, some respondents feel that there should be a limit on the number of pots that can be put out per fishermen. One suggestion is for 100 pots per man, whereas one of the boats working out of Falmouth has 1800 pots, with a number of the Cadgwith boats working 5-600 pots (IF: Interviewee 6).

In the run-up to the last round of CFP modification in 2012, Greenpeace, NUTFA (New Under Ten Fishermen's Association), UK Fisherman's Associations and fishermen produced a 'manifesto for fairer fisheries'. They argued that: "The CFP favours the most influential parts of the European fishing industry, often those operating with the highest environmental impact and least benefit to society. Meanwhile, responsible fishermen, who use sustainable methods, are in real danger of losing their livelihoods. The CFP currently threatens the future of our fish, our fishermen and the coastal communities that rely on them. The UK's maritime heritage is at stake" (Greenpeace and NUTFA 2012, p. 1). The focus of this manifesto was to recognise the importance and value of inshore fishing, and to highlight that the majority of quota (effectively, the right to fish) has been targeted at large-scale fishing operations. In terms of numbers, the inshore sector in the UK comprises nearly 80% of the boats, yet receives only around 8% of the annual quota (MMO 2015). Arguably, therefore, in order to reflect the different orientation between the two fisher groups, there should be different management regimes for large-scale fisheries and small-scale fisheries, with the former focused on economic efficiency, while the latter focus more on social objectives (Urquhart *et al.* 2011).

4.2.2.2 Protecting local quota

"The management of each country's share of TAC (or quota) is decided at member state level. Within the UK, the quota management system has evolved from one where quotas were effectively community / state owned to one of privately owned individual quota rights (i.e. the privatisation of a state resource, where quota is freely tradable) with each vessel owner holding a share of the quota known as a Fixed Quota Allocation (FQA) unit. As fishermen retire or

⁵ The minimum size limit is 90 mm within the 6 nm zone, and 87 mm beyond that limit. The 90 mm limit is set by the UK, whereas the 87 mm limit is set by the EU.

otherwise exit the industry quotas are sold and increasingly the highest bidders are larger companies outside Cornwall. This trend reduces the availability of quota left to the existing Cornish fleet, making it almost impossible for new entrants to join the industry... Without young fishermen the Cornish industry has no future". In addition, existing Cornish fishing businesses are unable to grow or modernise, if restricted in terms of the quota they can access/afford to purchase (Duchy Fish Quota Co 2016) – see Figure 8.

Figure 8. Duchy Fish Quota Co.



Without access to quota, fishermen are unable to fish. In this respect, it is estimated that since 2005 £4 million of Cornish linked fish quota has been lost from the county due to purchases by larger companies outside of Cornwall. For example, if a fisherman in Cornwall decides to retire then there is no guarantee that their quota will stay local, it could go to a Spanish or Scottish boat. Some of the larger trawlers have quota that is worth in the region of £1 million. There are very few fishermen in Cornwall who would be able to afford to buy this level of quota. If sold to a company from outside the county, £1 million worth of fish a year could be lost from Cornwall. When this happens, the wider supply chain also suffers as well as the wider economy. In addition, access to quota for the under 10 m boats is problematic, in that it is often sold in lots that are too expensive for small boats. As stated on the Duchy Fish Quota Company (DFQC) website: "Taken to its logical conclusion Cornwall – a county, surrounded by sea and abundant fish stocks - could be left without quota for Cornish fishermen to catch these fish". To try and help counter this trend, the DFQC was established as a not-for-profit company in 2001 by members of the fishing industry who were concerned at the trade in fish quota and the impact this was having and might continue to have on the Cornish fishing industry. Its stated mission is to 'Keep Cornwall Fishing', both now and forever. Key to this is the ambition to raise £24m (which was the approximate market value of all quota held by Cornish vessels in 2015) to buy fishing quota back from fishermen, which will then be community-owned and available to lease back to current and future generations of Cornish fishermen. It is difficult to say what the average value of quota attached to an inshore fishing boat is, but it is in the region of £5000. In other words a boat can land £5000 worth of fish, which also means that they need to catch a lot of non-quota species in order to make an adequate living (Round Table 1).

Quotas are released on an annual basis at established market rates, meaning that they are then compliant with EU State Aid rules. Applications from both under 10 m and over 10 m vessels are treated equally, in that the DFQC recognise that irrespective of vessel size there is often insufficient quota available. Between 2001 and 2015, DFQC invested £250,000 (raised by corporate donations, public fundraising and bond sales) into fishing quota, and leased quota in £5000 chunks (making it affordable to smaller scale fishermen) to more than 50 Cornish vessels. In other words, a good start, but they still have a long way to go to reach their stated ambition.

4.2.2.3 Latent capacity

At the beginning of March 2016, the MMO sent out letters to all under 10 m vessel owners that did not have a history of catching a particular species in a recent three year reference period (2010-2013). If their licence allowed for them to catch a particular species and yet none of these fish were caught during this reference period, then their licences were capped and they would no longer be able to catch this species. The license for this will then be transferred to other boats within the under 10 m sector. There is some scepticism about this within the industry, which is typified by this response: "it will be the same amount of quota, the same amount of fish caught, by fewer boats and therefore it is easier to manage. It's about control; it's not about preserving fish stocks in my view" (IF: Interviewee 1). The MMO perspective is that there is quota available which is not being utilised (known as 'latent capacity'). By transferring it to those who will catch their allocated quota, the amount of fish caught can be maximised.

"There is a massive amount of quota which hasn't been used at all, just sitting dormant, and so they looked at a reference period of three years and set fairly low benchmarks (about 300kgs). They have to have used at least that much in at least one of the years of the reference period or they will be capped". (IF: Interviewee 3)

Any quota that is capped will go back into the main pool. (IF: Interviewee 2). However, whatever the perspective taken on this process, it is clear that it reduces the flexibility of smaller fishermen in terms of what they can catch and when:

"They've said to those boats that haven't been using their quota, we're going to cap your licence now. But the whole point about inshore fishing is opportunism and diversity... I mean people have paid full price for their licenses, with the expectation that they can diversify into this, that and the other, as needs be, which is what you need to have in the inshore fisheries to be successful. It's how it's always operated, for hundreds of years... I've got a full licence, now you're telling me I can't do this or that based on a track record going back several years... Suddenly you've got a boat with its licence attached to it which is not worth so much because it can't do half the things it used to be able to do. So if that's supporting inshore fisheries communities, I'll eat my hat! (IF: Interviewee 3).

It is clear that this issue has angered a number of people, as evidenced by this quote:

"If a small boat has a track record of not catching many pressure stock fish, the government are trying to cap it at that level. And they made a reference period recently of 2010-2013 and anybody who hadn't caught a certain amount of pressure stock fish in that time had their licence capped. The dishonesty of government is quite incredible. Since 2013, many people have bought a licensed boat in good faith, with no idea that this license capping was coming in and they bought it to be able to carry on fishing from the under 10 m pool. And suddenly they are told, having invested in gear, a boat, licence and everything else, that the licence they have got is going to be capped, which effectively stops them from earning a living. It is the license that is capped because they haven't caught enough quota over the reference period. So if somebody bought a boat in 2014, and it hadn't caught a lot between 2010-2013, they are likely to have their licence capped". (IF: Interviewee 13).

4.2.2.4 Discards and landing obligation

The discarding of fish is a widespread problem in EU fisheries, resulting from a number of interrelated issues. First, TACs create incentives to discard the over quota catch of lower valued quota species in the expectation of catching higher value fish later on. Second, regulations on mesh size and minimum landing size leads to the discarding of undersized fish and to the use of non-selective gears. As a result, a large amount of fish are regularly disposed of at sea, often already dead, generating both waste and a reduction in fish stocks and biodiversity that are not accounted for in the statistics. From a production point of view, by-catches and their subsequent discard are a waste of future fishing opportunities; from an ecological perspective, discards have a negative impact on marine ecosystems. Discard rates range from 25-70% depending on the target species, gear used and trawling speed.

In 2010, appalled by the amount of edible fish being thrown back into the sea as discards, the chef/broadcaster/campaigner Hugh Fearnley-Whittingstall launched a campaign known as 'Fish Fight' that sought to change the way fish is caught, sold and consumed in the UK, across Europe and around the world (Fearnley-Whittingstall 2010). It garnered huge support through its website and the wider social media, and there is little doubt that it had an important part to play in encouraging the latest reform of the CFP to include a reduction of discards as a specific objective, and to focus on encouraging more selective fishing that would avoid undersized, over quota or non-target species.

In order to reduce waste, and pushed by public opinion, the EU is in the process of implementing a discard ban by introducing an obligation to land all catches. This obligation is gradually being introduced on a fisheries-by-fisheries basis between 1st January 2015 and 1st January 2019. The reason for the phased implementation is to allow time for fishermen to adapt their fishing practices. This may include improving equipment and fishing gear for selectivity, as well as onshore operations making changes that enable them to handle undersized fish that are not intended for direct human consumption (Seafish 2013).

From 1st January 2015 all vessels catching pelagic species, such as mackerel and herring, have had to land all pelagic fish caught. From 1st January 2016, the landing obligation was extended to certain demersal species, such as haddock, sole and plaice dependent upon which sea area is being fished and what type of fishing gear is being used. Currently (February 2016), the landing obligation only includes pelagics, salmon and cod in the Baltic Sea. By 2019, it is planned to be in force in all EU waters and to cover both pelagic and demersal fisheries. Once the phased approach is complete in 2019, all quota species will be included (Seafish 2013).

Essentially, the discard ban concerns species that are subject to catch limits or minimum landing size. Catches of these fish should be retained on board the fishing vessel, recorded and landed; they will then be counted against any quota that the fisher has, in weight terms. Taking this approach can help reduce the level of undocumented catches; it will also help collect more accurate data in relation to stock assessment and thereby help to better allocate TACs (Condie *et al.* 2014). "Undersized fish cannot be marketed for the purpose of human consumption. The pelagic fish species most likely to be affected in Cornish waters under the landing obligation are mackerel and herring caught by ring nets, but non pelagic quota species caught at the same time must also be landed. Undersized fish not under quota must continue to be returned to the sea" (Cornwall IFCA 2015b, p. 9). Exceptions to the obligation to land include species that have a high

survival rate (in other words those species that have a high survival rate once caught and can therefore be thrown back alive), species that it is prohibited to catch, or when from a technological point of view selectivity is particularly difficult to achieve (Salomon *et al.* 2014). The Discard ban is a strong incentive for fishers to adopt more selective gear. However, given that the ban applies only to species of economic interest, it is not expected to have a huge impact on safeguarding marine biodiversity (Salomon *et al.* 2014).

The discard problem in the EU has historically been associated with medium to large-scale fleets (in particular large mixed species trawl fisheries), yet the discard ban also concerns and affects small inshore fishers. In this respect, the landing obligation will also impact fishers that have smaller boats with a relatively small storage capacity, a limited workforce and limited technological capacity. It will also involve more time in handling and sorting the fish; while at ports there will be a need for increased processing and storage capacity for the less valuable species that would previously have been discarded. Increasing the storage capacity of these boats will require investment (although the CFP helps in this respect) and the landed discards will become a “special waste” with high disposal costs. According to Veiga *et al.* (2016), the long-term effects of the landing obligation are unpredictable, although current evidence suggests that in the short to medium term it will bring more negative social, economic and ecological impacts, than benefits.

A situation that can occur in areas where different species of fish swim together in the same habitat (known as mixed fisheries), is a choke situation. What this means is that if a fisher has fully caught their quota for one species before catching all their allocated quota for another species in the same sea area, then the vessel concerned will have to stop fishing in that sea area due to the fact that they cannot guarantee avoiding the species for which they have no quota left, even though they may be intent on catching another species for which they still have quota. The species that they have run out of quota for is known as a ‘choke species’ and will always be a species liable to quota (Seafish 2016). This is a real problem for fishers in Cornwall, where the average trawler may well catch up to 30 different species every day it goes to sea (IF: Interviewee 13).

As the landing obligation was driven by a public debate on discards and a petition signed by 650,000 people organized by NGOs, fishers were not involved in the decision to establish landing obligations and they can have a role only during their implementation at the regional level of specific discards plans (de Vos *et al.* 2016). The landing obligation is unpopular and not supported by the fishing sector. Although many fishers agree that something needs to be done regarding by-catches, the actual regulation is for many not implementable. They state that regulations are being made by people that lack knowledge of fisher practices. Because of this lack of legitimacy, fishers have responded with suspicion, and anger, and it is important to consider that it is the fishers’ behaviour that ultimately will determine the success or not of the policy (de Vos *et al.* 2016).

Discard bans are not a novelty in the regulation of fisheries. They are currently implemented in Alaska, British Columbia, New Zealand, the Faroe Islands, Norway and Iceland. Experience from these countries highlights that landing obligations can result in a reduction of discards. However, simply banning discards will not result in a significant reduction in discards; to be effective it is

necessary to have a high level of surveillance as well as economic incentives to encourage fishers to land more of their catch and to fish more selectively (Condie *et al.* 2014).

The fishing fleets of the MS within the EU have very different characteristics compared to those countries currently using landing obligations (such as in NZ or Norway). The EU fisheries are less extensive and more mixed. In this respect, the EU fleet is highly heterogeneous containing a large number of inshore fisheries. The landing obligation does not account for such heterogeneity, and is applied in the same way to all fisheries (Veiga *et al.* 2016).

4.2.2.5 Funding initiatives: European Fisheries Fund - FLAGS

The classic European rural developmental model in post-war Europe has been an exogenous one, focused upon technological development, intensification and specialisation within sectors. Decisions have been taken at a distance (at a national or EU level), rather than at the level of particular contexts or territories. By the early 1980s, it was increasingly acknowledged that this approach had not worked and rural development support moved from exogenous to endogenous approaches. The LEADER programme and Axis 4 of the European Fisheries Fund (EFF) are examples of endogenous approaches, reflecting a move away from solely sector-focused development towards the territorial, wherein local skills and assets are recognised and supported. In relation to fisheries, which are generally perceived to be an industry in terminal decline and therefore not able to drive economic development in the areas concerned, new narratives are emerging which suggest that fisheries do have an important part to play in developing local economies. Axis 4 of the EFF⁶ (Council Reg 1198/2006 Article 4) ran from 2007-2013, and aimed to 'encourage sustainable development and the improvement of the quality of life in areas with activities in the fisheries sector'. As such, Phillipson and Symes (2015, p. 346) suggest that "Axis 4... raises the question of whether fisheries, rather than simply being defined and managed as a national or European economic sector producing commodities for distant markets, can become re-integrated as a positive force for territorial development". Phillipson and Symes (2015, p. 347) go on to ask: "But how should sectoral and territorial development trajectories be balanced and integrated? Should the emphasis be on fisheries initiatives, supporting the sector's competitiveness, sustainability and attracting new blood to the sector? Or should it be on the wider social and economic diversification of coastal economies and re-skilling of fishers out of the industry?" In other words, direct support for the fishing industry, or more in terms of support for economic diversification?

Central to the approach of Axis 4 are Fisheries Local Action Groups (FLAGS), which are described by Phillipson and Symes (2015) as a 'middle way' between sectoral and territorial development. FLAGS are public-private partnerships, intent on mobilising the internal capacities of the areas concerned, including social capital, in order to develop local fisheries and the wider quality of life in the territories involved. In the process, stakeholders from a range of local economic interest groups, including fisheries, are brought together in order to help develop an integrated development strategy that can help combat a range of issues faced in the local area. "A cornerstone of the Axis 4 approach is its aim of gathering together different stakeholders in order to stimulate new thinking about how all economic sectors can interact at the local level to deliver mutually beneficial outcomes" (van de Walle *et al.* 2015, p. 372). Despite a slow start, by

⁶ The EFF was established in 2007 and ran until the end of 2013.

early 2014 there were over 300 FLAGs across 21 of the 27 EU member states (Phillipson and Symes 2015). Van de Walle *et al.* (2015), in discussing the importance of the fishing industry to the Pays d'Auray region of France, argue that it is a significant and 'authentic' attraction for visitors to the area that has been supported and preserved by the local FLAG for the greater good of the area.

In Cornwall, the first FLAG Strategy and Delivery Plan was agreed in 2012 and covered the whole of Cornwall and the Isles of Scilly. Building on the "Objective 1 Cornwall & Isles of Scilly Fishing Industry Task Force Strategy 2000–2010...[its] emphasis [was] placed on the fisheries sector rather than territorial development *per se*" (Phillipson and Symes 2015, p. 350). "The formal aim of the FLAG [was] 'to maximise the economic opportunities and benefits open to Cornish fishing communities in a sustainable and cooperative environment, which builds the capacity of those who live and work in them'" (Cornwall & Isles of Scilly Fisheries Local Action Group 2011, p. 4 quoted in Phillipson and Symes 2015, p. 350). The FLAG board was responsible for managing the strategy, together with the Cornwall Development Company (CDC), which is an arms-length economic development company of the local authority who help determine the eligibility of funding proposals. The FLAG comprises a wide range of interests, including representatives from the Cornish Fish Producers' Organisation, harbour masters, port-based fishermen's associations and a range of public, private and third sector representatives. The FLAG also invites 'advisers' to attend meetings on an ad hoc basis, including representatives from the Cornwall and Isles of Scilly Inshore Fisheries and Conservation Authorities (IFCAs).

In relation to new entrants (see also section 4.2.4 below), the FLAG recognise that the key barrier to a single/young person trying to access the industry is that they can't afford a boat; furthermore that the skipper of a two-man boat wants someone with experience. In other words, the new entrant is caught in a double bind (IF: interviewing 5):

"You've got your qualifications, you've done three weeks, but you haven't got the experience. So we're currently working on a separate bid to fund a new entrants' training boat that will pay for an older skipper and will give new entrants a month's experience so they can then at least apply for jobs saying they have got a month's real experience behind them".

In the second round of FLAG (which started in 2016), £800,000 is available, with one of the key areas of focus being on innovation and adding value to fish (access to the market is covered in more detail under section 4.3.1), not least due to the landing obligation (see section 4.2.2.4) and the obligation on fishermen to land everything that they have caught. What this means in practice is that there are (IF: Interviewee 5):

"A lot of species coming in that don't have markets, and a lot of sizes that aren't popular. So the restaurant trade wants a number three sole, which fits perfectly on a plate, but if you're landing a lot more smaller one, there's got to be some work and education about how that value is done and also by-products. There's an awful lot of filleted fish that's sold, but all those fish skins are a waste product... But in France they've been doing lots of work on turning it into leather and we're quite keen here to see if we could use FLAG money to take fishermen and show them other things - fish or pesca tourism or fish leather or anything else that people are doing with fish or fish by-products".

Making best use of the potential purchasing power of the 4.5 million visitors who come to Cornwall every year is another key aim of the FLAG. A key focus in this respect is providing fishers with the skills and tools to access the market in order to increase their profits, as well as ensuring that the profits stay within the county and the wider fishing community. For example (IF: Interviewee 5):

“A Hayle crab boat was struggling to sell his crab for a reasonable price. So the FLAG supported him in investing in a crab potting process. This involved preparing the crab meat and putting it in nice jars with nice branding. He now can't keep up with demand. This is a really good way of marketing a product that comes in all year round, but can be preserved and then sold to the millions of tourists who come down only in the summer”.

4.2.2.6 Acknowledging the ‘social’ within policy and regulation

As outlined above, there is no question that the fishing industry is under pressure, with many commercial species in serious decline. This is having a major impact on the livelihoods of fishers, especially small-scale inshore fishers, together with the communities in which they live. However, the main focus of both research and policy has tended to be on the biological and economic aspects of fishing, with scant attention paid to the social and cultural impacts of the pressures faced by fishers. At a European level, the focus of fisheries policy under the CFP has tended to be in terms of modernisation and rationalisation, linked to licensing and quotas. In this respect, the focus has been on technical measures such as net mesh size, closed seasons and boat decommissioning, together with restrictions on the quantities of fish that may be caught each year through the use of annual Total Allowable Catch (TAC) restrictions that are allocated to each Member State (MS). It is then up to each MS to allocate national quotas as they see fit, through the use of both Fixed Quota Allocations and Individual Transferable Quotas. In this sense, there is a division of responsibility between the EU and member states, with the former responsible for strategies to prevent overfishing and the latter for determining how best to achieve these ends. In taking this approach, quantitative scientific data tends to get prioritised, rather than examining the lives of those involved in fishing; what is also clear is that any social problems resulting from such strategies are the responsibility of the MS rather than the EU (Ross 2015; Symes and Phillipson 2009, p. 4; Urquhart *et al.* 2011).

Indeed, Phillipson and Symes (2015, p. 344) argue that “the European Commission has never been comfortable in its handling of socioeconomic issues in fisheries. In the past, funding was available for modernisation and renewal of the industry’s physical capital (vessels, port infrastructure and processing plant), but little energy was expended on renewal of social capital (employment, skills and entrepreneurship). There was a brief flicker of interest in the 1990s, with the creation of a separate fund to support the industry (FIFG 1994–2006) and a dedicated, albeit short lived, initiative (PESCA 1994–1999) focusing on community development and alternative employment opportunities outside fishing”. “Rather than serving as an active influence in shaping fisheries policy, social issues are seen rather more as the irritating consequences of policy” (Symes and Phillipson 2009, p. 3).

It is significant, however, that the resilience of inshore fishers and their associated communities involves more than simply the economic, generating both social and cultural capital that in many cases provides “the glue that holds the community together” (Urquhart *et al.* 2011, p. 243). In this sense, there is a need to respect that fishing is often more than simply a way to earn a living,

but also a means of defining identity. The risks and uncertainties associated with inshore fishing (such as weather conditions, species availability and market prices) also help build a sense of solidarity as those sharing the same challenges are able to have a sense of 'shared empathy' and understanding (Ross 2015). Understanding resilience within this context requires a multidisciplinary approach, involving the natural, social and political sciences, in order to encompass the breadth of users who have an interest in coastal communities. However, Symes *et al.* (2015, p. 249) stress that the social is particularly important, in that "resilience is deeply embedded in the social structures, relationships and behaviours associated with coastal fisheries and their host communities".

4.2.3 Finance

The following data is taken from an interview with Barclays Bank, Cornwall (IF: Interviewee 12). Over the last 10 years or so it is apparent that the number of smaller fishing vessels that the bank supports has declined by about 25%. This is usually due to decommissioning, or that fishers have sold up and moved out of the industry. The fishers that this bank supports vary from small handliners up to small fleets. The bank has three key criteria that they consider before offering a fisher a loan: firstly, what is being offered as security -- whether it is a fishing vessel, licence or house; secondly, can they prove they are able to service the loan, as well as have enough money to live on; thirdly their track record. The bank will look at the value of the boat and license combined and then lend up to 50% of that value, as a guideline. They might also take a charge over the fisher's home. The bank will only lend up to a maximum of £25,000 as an unsecured loan; anything over that requires security. Normally, the maximum period of a loan is 10 years. If the bank feels unable to provide a loan, then this interviewee felt there are very few other places that a fisher might turn to for financial support.

There is recognition that the fishing industry requires a careful lender, in that there are so many things outside its control, such as the weather, natural breeding processes and legislation/regulation. The bank no longer use quota as a form of security, because it is not something that the bank can control in terms of whether it is sold or not. Whereas with the vessel and licence, the bank is able to take a formal legal charge over them meaning they cannot be sold without the bank's permission. Nevertheless, where a fisher does have a large amount of quota, it is indicative of the business investing in its future. In relation to the value of a fishing vessel, they have a professional valuer to do this for them. Key issues to look at are the condition of the boat, as well as its maintenance and service history. Has it got at least a ten-year lifespan. An older vessel may well require expensive maintenance, as well as use more fuel (the main ongoing and increasing expense that fishers face). As a result, the profit potential of the boat can be significantly degraded.

In relation to succession, discussed in more detail in section 4.2.4 below, finance can be a problem for those wanting to get into the industry.

"Most of the young guys that I've met that want to get into the industry, do it through the family initially. It's just like buying a house: if you haven't got the stake, it's very difficult to start isn't it?... I've been asked to fund boats for £30,000 upwards. The last one I did was £1.2 million. I mean they need to take the long route and get the experience, crew, then skipper for somebody else and then get their own vessel" (IF: Interviewee 12).

4.2.4 Recruitment and succession

Intergenerational continuity is a key issue when addressing the sustainability and resilience of inshore fishing across Europe. Traditionally, many fishers came through the hereditary pathway. However, fishing is no longer seen as the occupation that it once was in terms of status, financial rewards or job security. There is no longer the same pressure within families to persuade sons to follow their fathers, with the result that aspiring fishers increasingly come from outside the fishing community. This creates an additional problem for aspiring fishers, both in terms of finding the necessary finance to purchase a boat and license, but also in terms of gaining experience through working on boats and 'learning the ropes' (White 2015).

To date, policy support at an EU level has been principally financial, through the European Maritime and Fisheries Fund (EMFF) [Regulation No. 508/2014] (2014–2020), wherein Article 29 relates to support for apprenticeships and Article 31 endorses start-up support for young fishers. However, White (2015) posits that a sectoral approach is likely to be too narrow: recruitment also needs to look to the wider coastal rural economy and to develop integrated multi-sectoral strategies through a FLAG, for example.

Normally, fishing employment is either as crew, or as a skipper-owner. Working as crew is now less common, as many inshore fishers have adapted their boats to enable them to fish single-handedly in order to reduce crew costs and improve their profitability. The introduction of obligatory training courses for new entrants has created an additional hurdle, in that in most cases boat skippers will not fund them, meaning that the aspiring entrant must pay for them themselves. Even where an aspiring entrant completes a training course, this may not help them find employment in that most fishers place more importance on experience-based learning through working on boats. In this respect, research by White (2015, p. 297) suggests that "formal training requirements are seen by fishermen as 'hurdles without meaning' and as undermining the natural process of recruitment".

The result is that aspiring fishers must increasingly look to own their own boat, which involves considerable investment in terms of the vessel itself, fishing gear and a fishing license. Getting hold of a fishing license can be problematic in itself, in that no new licences are being issued. There is some provision to disaggregate licenses, whereby you can create two licenses out of one⁷. Essentially, this enables you to put two smaller licenses on two smaller boats, in that the licence has a capacity rating in terms of engine and tonnage (IF: Interviewee 1). In terms of cost, a beach boat is in the region of £30,000–£40,000, up to more like £200,000 for a larger crabber; in addition, the cost of a licence⁸ can be more than £10,000. Taken together, this level of cost prevents many aspiring skippers from becoming active fishers; it is also leading to an ever increasing average age of fisherman, with less than 20% being under the age of 30 and the average age approaching 60 (White 2015). White (2015, p. 304) argues that there is a parallel here between fishing and farming, which she suggests represents "a wider crisis of youth

⁷ However, each time this happens, some of the capacity of the licence is lost.

⁸ In addition to the financial cost of the licence, it is necessary to find an existing licence holder who is prepared to give up their licence, in that no additional licenses can be issued / are available (White 2015).

employment in rural areas". In this respect, she argues that: "If maintaining small-scale fisheries is a policy objective, ensuring recruitment is crucial to future resilience" (White 2015, p. 306).

The latent capacity issue set out under section 4.2.2.3 has the potential to exacerbate the problem of recruitment and succession, as exemplified by the following quotation (IF: Interviewee 1):

"I think the latest round of licence capping is only going to make it more expensive for people to enter the industry from the bottom up because it is getting prohibitively expensive. Even to buy a small 15 foot boat can be anywhere up to between £10-20,000 and for somebody that doesn't have that sort of money, it's very very difficult to get in and by limiting the number of boats that are able to catch enough fish to make a living, then you're only going to increase the price. So for the small Cornish communities, particularly the coves, that's going to be a problem...and I can see that in some places there being no fishing boats left, because of policy to reduce the number of licences that enable fishermen to actually go and make a living."

4.2.5 Fisheries management and marine conservation

Over the last 50 years, there have been significant terrestrial conservation measures; by contrast the oceans are poorly protected, with only 1.17% of the Marine area designated as marine protected areas (MPAs). The marine environment is extremely complex and variable, meaning that it is also scientifically uncertain. As a result, management decisions are often based on the 'precautionary principle', although what this means in practice is inevitably subjective and contested (Fleming and Jones 2012).

There is a widespread perception that fisheries management in the EU, via the CFP, has failed to deliver sustainable fisheries and economic vitality, with one of the generally accepted reasons for this being a lack of transparency and the failure to include a wide range of stakeholders and perspectives. In countries where there is a more devolved management structure, such as Norway, USA and Canada, there has been "some success in instilling in stakeholders a sense of trust and legitimacy in the fisheries management decision-making process and in doing so improve[e] the rate of compliance" (Rodwell *et al.* 2014, p. 285).

Defra's vision for the English fishing fleet is for it to be "an economically and environmentally sustainable industry"; in addition, they aim to "protect the viability of stocks while safeguarding and enhancing the marine ecosystem" (Defra 2014, p. 3). Functionally, it is the Marine Management Organisation (MMO), an executive non-departmental public body, who are responsible for marine planning and fisheries management in the UK. More broadly, Natural England is the UK Government's adviser for the natural environment in England. Specifically in relation to the marine environment, they have responsibility for advising on how to ensure marine biodiversity and its protection in inshore waters (0 to 12 nautical miles) (Natural England 2016). To help facilitate this, they are permanently represented on Inshore Fisheries Conservation Authorities' committees (see below).

A key impetus for change within the UK was the Defra publication *Safeguarding our Seas* (2002), which set out the aspiration to adopt an ecosystem approach to marine policy; furthermore that

this required the empowerment of a wide range of marine users/stakeholders, most notably those operating in inshore waters. A key result of this publication was the Marine and Coastal Access Act 2009 (MCAA), which resulted in the Government developing a new framework to integrate fisheries and environmental management goals, and to enable those who may have very different views to have a better chance of making collaborative decisions through participatory governance (Rodwell *et al.* 2014). Under this Act, the UK Government is committed to implementing a network of Marine Protected Areas (MPAs), which are to be developed via a stakeholder participation process that entails the collaboration of scientists, fishermen and conservationists. MPA is a blanket term which covers areas of sea and coast where wildlife and habitats are protected from damage and disturbance. In the UK, MPAs have primarily been set up to help conserve or recover nationally significant or representative examples of marine diversity (Seafish 2013).

Natural England is a non-departmental public body who advise DEFRA on marine nature conservation, including MPAs. They provide advice to DEFRA in terms of designating particular sites, but also then providing conservation advice to the regulators such as the MMO, harbour authorities or IFCA. In this respect, it is important that Natural England is represented on the board of the local IFCA, who in most instances are the site managers. In seeing a protected area on a chart, the immediate reaction of many fishermen is to feel that they will be unable to fish in that area. In reality, the extent to which MPAs might affect fishing depends upon the type of fishing involved: for example, whether it involves static gear or trawling; it will also depend upon the reason why the site is protected. Natural England are intent on communicating with fishers, recognising that their decisions will affect people and that the MPAs are likely to be more effective if those involved can see the logic behind their designation. MPAs are considered integral to ensuring that fishing within Cornwall remains sustainable (IF: Interviewee 7):

“I think that the one thing everybody wants to see in Cornwall is a sustainable fishing industry. It is part of the heritage, it's part of the culture, it's what encourages tourism. It's livelihoods for small villages around the coast. It's what the MMO, the IFCA, Natural England, PO, all of them, want. All of us work together to ensure that we have that... There are lots of external pressures on the industry, marine protected areas being one of them. But I truly believe that everybody wants to have a sustainable fishing industry in Cornwall. It's really important.”

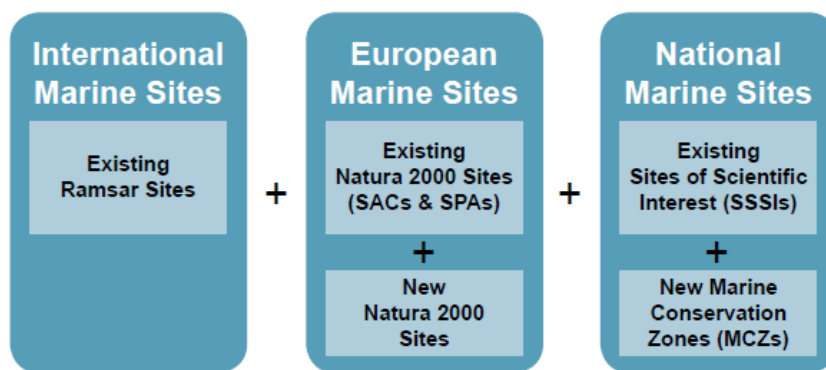
The importance of working with the industry to achieve sustainability goals is emphasised by IF: Interviewee 8, who works for the Cornwall Wildlife Trust:

“I don't think many environmental organisations are dead set against fishing... We've got to work with the industry...Certainly some of the most successful initiatives have actually come from the fishing industry, such as the Trevoze box (or cod box), which is a closed area...That is an area which fisheries, scientists and fishermen have known for a long time is incredibly important to many species during spawning time, and it was actually the Cornwall FPO members who initially said that they were unhappy that massive amounts of fish were being taken during spawning time...So they got together with fisheries representatives from all across Europe and came up with a plan to have that as a closed area through spawning season every year, and it's been really highly successful. Not only do cod spawn there, but also a lot of flat fish species... We'd like to see more like that”.

There are a number of different types of MPA (Figure 9) each of which has different levels of protection and different regulations and codes of practice (Cornwall IFCA 2015b; 2016):

- *European Marine Sites*, which include Special Areas of Conservation (SACs) – there are five in the Cornwall IFCA district - and Special Protection Areas (SPAs) - there are two in the Cornwall IFCA district - which are designated under the EU Habitats and Birds Directives respectively and form part of the European-wide Natura 2000 network of internationally important sites.
- *Sites of Special Scientific Interest (SSSI)*, which are designated under the UK's Wildlife and Countryside Act 1981. These are primarily land-based, but sometimes extend below the low water mark.
- *Ramsar sites*. The Cornwall IFCA district does not contain any of these sites.
- *Marine Conservation Zones (MCZs)* protect a range of nationally important marine wildlife habitats and seabed features - there are five which are situated wholly or partly within the Cornwall IFCA district. No site-specific regulations are currently in place for the designated MCZs.

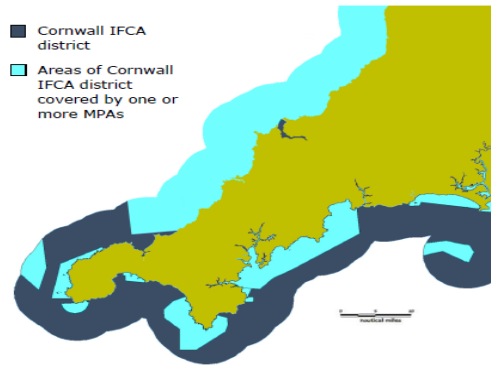
Figure 9. Different types of Marine Protected Areas



Source: Seafish (2013, p. 3)

Another form of MPA is 'No-take Marine Protected Areas (NTMPA), which can be defined as "marine areas in which the extraction of living and non-living resources is permanently prohibited, except as necessary for monitoring or research to evaluate effectiveness" (Jones 2008, p. 749). Inevitably, conservation measures such as these are a cause of concern for fishers in that they directly affect their right to fish. In this respect, a key question in relation to stakeholder participation is: "what constitutes an appropriate balance of power in order to fairly consider both the achievement of conservation goals and the fulfilment of more local economic and social properties" (Fleming and Jones 2012, p. 372). At present, there are no 'no-take' areas within Cornwall (IF: Interviewee 1).

Figure 10. Cornwall Marine Protected Areas



Source: Cornwall IFCA (2017, p. 2)

The Marine Act (2009) also resulted in the formation, in April 2011, of 10 Inshore Fisheries Conservation Authorities (IFCAs) to replace the existing 12 Sea Fisheries Committees (SFC). The stated mission of the IFCAs is to '*lead, champion and manage a sustainable marine environment and inshore fisheries, by successfully securing the right balance between social, environmental and economic benefits to ensure healthy seas, sustainable fisheries and a viable industry*' (Cornwall IFCA 2015a, p. 7). As such, "their remit includes fisheries regulation, stock enhancement, monitoring and enforcement. They are... also responsible for environmental management tasks such as ensuring that fishing is compatible with the conservation objectives of the Special Areas of Conservation (SACs). IFCAs are funded by local authorities but they report to Defra and are guided and supported by the MMO, a senior member of which sits on each IFCA" (Rodwell *et al.* 2014, p. 280). Membership of the IFCAs is more inclusive than the previous SFCs, with the aim of developing a more open and inclusive governance model that can deliver sustainable fisheries and help instil a sense of trust and legitimacy. Key to this approach is to proactively engage with fishermen, merchants and other stakeholders to listen to any concerns or suggestions they may have. As part of this approach, appointees to the IFCA are legally required to represent all local commercial and recreational fishing, as well as marine environmental interests, in a balanced way taking into account a wide range of economic, social and environmental needs. To this end, the 21 members of the Committee comprise seven members from Cornwall Council, 11 appointments by the MMO, as well as officers from the MMO, Natural England and Environment Agency. Nevertheless, despite this inclusive approach, there are clearly tensions between conservation and fishing, with concern amongst fishers about the increasing emphasis on marine conservation zones (Rodwell *et al.* 2014).

"The Cornwall IFCA District extends from Marsland Mouth on the north coast of Cornwall, around Land's End to the western end of the Plymouth Breakwater in Plymouth Sound on the south coast, for all the waters out to the six mile limit and includes the rivers and estuaries up to tidal limits...[and] includes a number of protected areas including five Marine Conservation Zones (MCZ) and seven European Marine Sites (EMS). Four further MCZs are expected in a future tranche of MCZ designation" (Cornwall IFCA 2015a, p. 6). Cornwall IFCA create and enforce local bylaws, as well as enforcing relevant national and European fisheries legislation. They inherited 64 bylaws from the preceding Sea Fisheries Committee, the Environment Agency and the Devon Sea Fisheries Committee. They conduct patrols and inspections at sea, which includes patrols around the coast, as well as visiting ports and harbours. They are financed

through a combination of local (Cornwall County Council) and Central government funding (Defra).

Figure 11. Cornwall IFCA District



Source: Cornwall IFCA (2015a, p. 6)

4.2.5.1 Ecosystem Approach to Fisheries Management

One approach to managing the marine environment is to take an Ecosystem Approach to Fisheries Management (EAFM). As mentioned above, this approach was promoted by DEFRA in 2002, as well as in the MCAA 2009. It has also been endorsed by the United Nations Food and Agriculture Organisation's *Code of Conduct for Responsible Fisheries* as an appropriate management strategy in the face of overarching uncertainty in relation to climate change and attendant changes to the ocean's chemistry. This code sets out the importance of conserving all species that belong to a particular ecosystem, which entails monitoring the impact of human activities on that ecosystem. Key to an EAFM approach is building resilience in relation to fish habitats and populations, as well as people's livelihoods and well-being. It encompasses the precautionary approach, as well as encouraging cooperation and coordination amongst institutions and different interest groups. To this end, "an EAFM aims to ensure that the capacity of ecosystems to produce fish and shellfish for food, employment and livelihoods, and to provide other essential services, is maintained for the benefit of the present and future generations in the face of variability, uncertainty and natural changes to coastal environments" (Heenan *et al.* 2015, p. 185). Crucial also, are clear communication processes in order to develop trust and confidence amongst the range of disparate stakeholders involved in the EAFM approach. An EAFM approach, therefore, through incorporating a wide range of stakeholders, has the potential to recognise and better encompass the social and cultural dimensions of inshore fishing (Urquhart *et al.* 2011). Two such approaches involve the National Lobster Hatchery and the 'Living Seas' programme (run by the Cornwall Wildlife Trust), both of which are described below.

4.2.5.2 The National Lobster Hatchery

One of the most important species, particularly for the inshore fishers of Cornwall, is lobster. It is a relatively high-value species, as well as not being subject to quotas. Its conservation is therefore critical to the ongoing sustainability of inshore fishers. It is targeted by around 400 vessels in Cornwall. Any boat that wishes to target shellfish must have a permit from the IFCA. The permit is issued for free, but on the condition that the boat concerned must submit monthly fishing statistics to the IFCA. Due to the importance of the lobster fishery, there are a wide range

of laws to help protect it. Amongst these, are the large minimum landing sizes, which are the largest in Europe. (IF: Interviewee 3)

"It tends to be mostly a day boat inshore fishery; intrinsically quite sustainable. It is quite localised, lots of small day boats... Obviously, the gear itself is fairly low impact, being static. The pots are lowered down in one place. They are lifted up again. There is not extensive dragging. They tend to be quite selective in what they catch. So they will catch crabs and lobsters. You get the odd dogfish in there, but the majority of stuff tends to come up alive... You don't have the problem of the whitefish scenario of scooping up a net and by the time you have got it up, it is all dead anyway. And the boats that catch them tend to be quite diverse. They will catch lobsters during the busy periods, they will also be catching some crabs, maybe doing a bit of netting in the winter. So they are not just hammering one species, with one type of gear all the time. They are spreading their bets across the ecosystem, depending on what is abundant at certain times of the year. But at the same time there are sustainability challenges" (IF: Interviewee 9).

Lobster stocks around the world are increasingly vulnerable, with stocks in both Scandinavia and the Mediterranean having completely collapsed in the past. The National Lobster Hatchery has as its primary aim "to help conserve the vulnerable lobster populations and preserve coastal marine diversity. In doing so [to safeguard] the livelihoods of small coastal communities and preserve our rich coastal heritage" (National Lobster Hatchery 2016). In other words, it is intent on conserving both the natural stock of lobster, while at the same time recognising that fishers need to continue catching them in order to survive as small businesses. In other words it is about sustainability, rather than stopping fishing. The hatchery aims to conserve the natural stocks of lobster, principally through its lobster stock enhancement programme, where they grow baby lobsters from eggs which are harvested in the wild, before releasing tiny lobsters back into the wild. They receive between 250-300 females a year from around 12 fishermen. The largest female can spawn as many as 50,000 eggs.

In 2014, they released 53,000 juveniles back into the wild. This requires the help of both local fishermen and dive groups, who provide the Hatchery with the egg-laden hen lobsters. They also conduct research into lobsters, as well as operating a visitor centre that has over 40,000 people per year, with the principal aim of educating potential consumers about the lobster fishery and the sustainability issues it faces. Critically, it also provides a key source of income to sustain the whole Hatchery project. (National Lobster Hatchery 2016)

4.2.5.3 *The 'Living Seas' conservation programme*

The coast around Cornwall has a very rich marine wildlife, but in many instances they are under threat. The Cornwall Wildlife Trusts Living Seas programme has been instrumental in pushing for the development of Marine Protected Areas (MPAs) in the English Channel area, keeping pressure on the Government "to ensure the Marine Act provides the necessary protection, especially through Marine Conservation Zones (MCZs) to give our marine wildlife the chance to recover and thrive". In this respect, the Government has decided that MCZs will be introduced in three tranches. The first tranche, in November 2013, involved 27 MCZs across the UK (8 in Cornwall). In January 2016, a further 23 MCZs were designated across the UK (9 in Cornwall), with the promise of a third tranche in 2018. The Cornwall Wildlife Trust is intent on working with

both the Government and interested stakeholders to ensure that the designated MCZs are properly managed and achieve their aims (Cornwall Wildlife Trust 2016b).

One of the key projects associated with the Living Seas programme is the development of the Cornwall Good Seafood Guide, which is intended to provide both consumers and businesses with information that enables them to make better informed choices about purchasing Cornish seafood. It is described in more detail under Section 4.3.1.2, below.

4.3 Market conditions

Fish and fishery products are among the most traded food commodities worldwide. Global fish exports increased from 25% of the total catch in the 1970s to 37% in 2012, reflecting the sector's growth in the global economy. In recent years, liberalisation policies, technological innovations, as well as improvements in processing, packaging, distribution, marketing and transportation have further accelerated this trend, increasing the complexity of supply chains in which seafood often crosses national borders several times before final consumption (Bellmann *et al.* 2016).

In global markets, both the EU and the US are net importers of seafood, in contrast to Asia, Oceania and Latin American which are net exporters. The EU is by far the largest import market, importing almost 25% of the seafood globally traded, followed by the US, Japan and China. In many developing countries (e.g. Seychelles, Cape Verde, Mozambique), fisheries export is a critical source of earnings, job creation, income generation, and ultimately growth and development (Bellmann *et al.* 2016).

According to the 2015 OECD-FAO Agricultural Outlook, over the next ten years per capita fish consumption will increase in all continents. Changing diets, rising incomes, and urbanization are likely to lead to an increased consumption of fish, with significant implications for fish prices. Fish prices are influenced by demand and supply factors, such as the costs of production and transportation, and the price of alternative commodities, especially meat. The limited potential to increase fish captures limits future supplies and may further increase fish prices (Bellmann *et al.* 2016).

The level of tariff protection on traded seafood is relatively low, for several reasons. The recognition of national Exclusive Economic Zones (EEZ) under the United Nations Convention on the Law of the Sea (UNCLOS) (which entered into force in 1994), gave exclusive national rights over fish stocks leading the rich importing countries to keep low tariffs on raw fish. However, tariffs on processed seafood are higher, which has the effect of excluding developing countries from exporting high value-added processed fish products.

Looking at the UK seafood market capacity, in 2014 UK vessels (inshore plus offshore) landed 756,000 tonnes of seafood for a value of £861 million. Compared with 2013, this represents a 21% increase in volume and a 16% increase in value. In 2014, average prices for demersal (whitefish and flatfish) species and shellfish increased, whereas the average prices for pelagic species fell (Seafish 2015). While shellfish represented only 32% of the UK seafood landed in terms of quantity, it represented 45% of the landed value.

In the UK, approximately 70% of seafood value is imported or landed by foreign ships. The most important countries delivering fish to the UK are Iceland, China, Germany, Canada, Denmark and Faroe Islands. In contrast, the top five UK seafood exports concern salmon, mackerel, nephrops⁹, scallops and prawns, which are mainly exported to France, the U.S., Ireland, Spain, China and Italy (Seafish 2015).

Since 2006 total UK seafood sales have steadily increased, reaching almost £3 billion of sales value in 2015. Fresh seafood is the main product driving sales growth, while frozen and ambient seafood sales have slightly declined since 2009. The top ten seafood varieties by sales value in the UK are: salmon, cod, tuna, prawns, haddock, pollack, mackerel, sea bass, scampi and trout (Seafish 2015). Seafood consumption in the UK is higher in the older stratum of the population rather than among the young, with seafood consumption particularly linked to a healthy lifestyle (Seafish 2015). A key issue in developing the markets for fish in the UK is to educate the British public about eating a wider variety of fish species. At present, the demand for cod and haddock dominates, while most British people have never eaten Megrin (for example), which is abundant in Cornish waters (IF: Interviewee 2).

It is important to note that the economic and market performance of the fisheries sector is not only important to the fishers themselves, but also to the wider communities in which they operate. It has been estimated, for example, that every fisher at sea creates a further four jobs on land. These jobs include processing, transportation and perhaps most critically, tourist jobs. In other words, the fishing economy at a local level involves more than simply the value of fish (Morrissey and O'Donoghue 2012). A seaside location, harbour and fishing heritage all draw visitors to a community. As such, in addition to the direct economic importance of inshore fishing, is the wider development of social and cultural capacity in the communities concerned (Reed *et al.* 2011).

IF: Interviewee 9 usefully summaries the issues that many fishermen face in relation to marketing their catch:

"The business model of fishermen is inherently flawed from a strictly economic perspective. Because when your peak season is, is everybody's peak season because these things are environmentally driven. In June when your pots are full, every other fishermen in the county's pots are also full. And when prices then drop, fishermen tend to react to that by trying to catch more and more and more and a lot of the time that is counter-productive because the prices just go further down, because you are swamping the market. So developing new markets is something to aim for. A huge amount of fishing economics is around the marketability of the product, rather than the catchability of the species."

4.3.1 Access to markets

Reed *et al.* (2011, p. 4) suggest that inshore fishermen have three principal routes to market: fish merchants (the most common outlet), who then take it to the end user/consumer; selling at harbour side auctions; and (less usually) selling direct into the hospitality trade. The latter

⁹ A genus of lobsters comprising a single extant species.

route to market results in the greatest economic returns for the fishermen, as well as for the wider community in that the fish then becomes part of the overall tourist offer. By contrast, the first two groups "strip the fish of its provenance, particularly in the case of prawns or other shellfish that are aimed at continental markets where they compete with other fish sold as a commodity".

Access to the multiple retailers is effectively impossible for small scale inshore fishers, in that these retailers almost exclusively use supply chains covered by various (usually expensive) certification processes (most usually MSC). As a result, the fish supply chain within the UK is largely "bifurcated, with the domestic inshore catch unable to find a way into the multiple retailers and in turn the supermarkets reliant on imported or farmed fish" (Reed *et al.* 2011, p. 63). Reed *et al.* (2011, p. 69) go on to suggest that inshore fishers must highlight the localness of their fish and build more linkages with the local community, including tourist enterprises such as restaurants and hotels. In so doing, they need to "celebrate what is particular, seasonal and tasty about their catch", thereby adding value to their catch as well as to the wider community. It also allows them to develop a degree of control over their market outlets. Diversifying their market outlets in this way helps develop resilience, but at the same time requires additional knowledge, investment and competence (Doeksen and Symes 2015).

The FLAG in Cornwall has had a part to play in developing the local fishing sector in coordination with the wider food economy. This is evident in Padstow, for example, where the town has been developed as a year-round gastronomic tourist destination, which is promoted on the basis of locally caught fish. Similarly, larger ports such as Newlyn are still principally about fish commodity sales, but they have also developed routes into the hospitality trade. In order to achieve this, there have been investments made to improve the quality/qualities of locally caught fish, not least by giving it a 'story' and a Cornish seafood brand that is associated with traceability and sustainable fishing practices. The lobster hatchery in Padstow is an example of this process (Reed *et al.* 2011).

Currently, fishers in Cornwall, especially the inshore fishers, use a variety of different outlets to gain market access. The most important market outlet for Cornwall fishers is harbour markets. The great advantage of these is that buyers pay directly to the fishermen, thus improving their cash flow. The most important harbour market in Cornwall is Newlyn, from where 80% of the fish landed are exported. This is mainly because there is simply not the demand for fish in the UK. The Newlyn market is a 'shout auction', which involves spreading the fish out in a market hall so that the merchants can see them. This differs from Plymouth, where the merchants usually do not physically see the fish, because they are graded and described (see below). There are ambitious plans for the Newlyn market, to develop it in terms of improving the onshore infrastructure (such as providing engineering facilities) as well as developing it as an Internet auction. (IF: Interviewee 15).

Looe fish market is the second largest in Cornwall, although the particularly large tides in this area restrict when day boats can come in or go out to sea. Fish sold at this market have been brought in from Mevagissey, Polperro and sometimes Newquay, in addition to those landed at Looe itself. Like Plymouth, it is also an electronic market, meaning that people can bid for fish from anywhere in the country. "If you go to our market in the morning, there are only two people there. The others are in their nice warm offices" (IF: Interviewee 16). Much of the fish sold here

is exported to France in vivier trucks that carry live crab and lobsters. Cuttle fish and squid go to Italy. It is clear that there is some frustration that more fish aren't consumed locally: "Half the battle is getting people to eat fish. There are lovely fish here. I do think people in Britain are getting better about fish" (IF: Interviewee 16). Port Isaac, on the northern coast of Cornwall, is specialized in trading lobsters and spider crabs for which it is the leading fishing port in the West Country. Padstow is specialized in spider and brown crabs. Shellfish landed in Port Isaac and Padstow are also mainly exported to France and Spain in 'Vivier' trucks, which enable the live export of shellfish. These trucks may only visit once or twice a week, so many of the local boats have pots located at the entrance to the estuary, which they use to store their catch in until the trucks arrive.

Cornwall fishers also have relatively easy access to larger harbour markets located in Devon. Brixham in Devon is the most important fishing port in England in terms of value of catch landed, with more than 40 different types of fish being regularly sold at auction. 50% of the auction is exported worldwide, although buyers include national processors and local fishmongers and restaurants. The catch landed at Brixham includes fish landed by local boats, non-local vessels and fish transported overland from other ports. Brixham fish market is also a tourist attraction. Plymouth is the second largest fresh fish market in England. Its turnover is steadily increasing every year, sustaining about 600 jobs either directly or indirectly. On average, Plymouth market trades 6,000 tonnes of fish a year, with a value of £17.35 million in the 2013/2014 financial year. At a regional level, Plymouth is the most important fisheries hub in the South West region. Indeed, about 70% of the fish sold at Plymouth market arrives by road from fishermen landing at other ports in the South West. The advantage for Cornwall's fishermen of selling through these ports is their greater international integration, allowing, depending on the season, for higher prices.

The Plymouth fish market is run by Plymouth Trawler Agents, who were founded in 1995. It is owned by about 110 shareholders, most of whom are fishermen. Originally it was a 'shout auction' before becoming an 'electronic auction'. In 1994 £700,000 worth of fish were sold; in 2014 £17 million worth of fish was sold. They now sell fish on a secure Internet site, which enables the market to attract buyers from all over the UK. Between 3-400 different boats land with them each year, including a large number of under 10 m vessels. Because they are effectively owned by fishermen, and their income is on commission only, it is very much in their best interests to get the best price for the fish they are selling. "It is in our best interests to get the best price for every kilo of fish, which benefits the boats and keeps the company going". Most of the under 10 m boats selling through the market are from Mevagissey, with sales in the region of £2 million a year. They also have a few under 10 m boats that land from Newlyn, Salcombe, Exmouth, Weymouth and Chesil Beach. Selling from the smaller boats does not really make commercial sense for the market, in that if a boat lands £100 of fish, for example, the market's commission at 4% nets £4, which needs to cover sorting the fish, grading it into species, icing it, putting it into a chiller, storing it overnight, selling it the next morning before then despatching it onto lorries. "The truth is, is that it is the bigger boats, who land much bigger catches, will in effect pay for the smaller boats to land at a price that the smaller boats can afford". The same is true in terms of transport, from Mevagissey or Newlyn, for example. There is a charge for transport in addition to the 4% mentioned above, but it barely covers the market's costs. Again, "the bigger boats, the beam trawlers, who are often castigated, actually generally

generate the income that helps support the infrastructure and allows the smaller boats to pay a reasonable price" (IF: Interviewee 13).

Every boat's catch is sold individually. The buyers at the market will not actually see the fish. They are buying it on the basis of the gradings made by the market, which means that they have to go beyond basic EU regulations. Their goal is to make the buying process as transparent as possible for their buyers: "We have got to be able to describe the quality of the fish more accurately than the EU grades allow us". The benefit of the smaller boats is that providing they look after their fish, which in most cases is less than a day old when it is landed, it has the potential to be of excellent quality.

"However, in order to make the best prices, fish have to be both very fresh and well looked after, which means being kept cold. This is not always the case with line caught fish. For example, if a boat has only caught two fish they may not be brought down on the same day to the market. They may go in the back of his car, in a poly box with a bit of ice. He may then catch a couple more the next day and then bring them down. Well, there will be a tag in to say that it is line caught, but that extra time when it has not been as cold as it should have been, greatly diminishes the quality. Yes, it is line caught, but the quality isn't what is expected of day caught line fish". (IF: Interviewee 13).

Many observers feel that, especially smaller scale fishermen, must add value to their catch if they are to survive. The smaller day boats turn over perhaps £200-£400 in a day, however it is difficult to be certain how many days a year it will be possible to go out. For example, if the boat is catching a quota species they will be capped in terms of the quantities they can catch; something that may be exacerbated where a 'choke' species is involved. Bad weather in the winter will also mean that the smaller boats are unable to go out and therefore to earn a living. In other words, maximising the value-added potential of their catch is likely to become ever more critical. There is also a cost: price squeeze that affects all fishermen. Diesel fuel and insurance, for example, have risen very considerably over the last 20 years, yet the price of harbourside fish has remained relatively static, seasonal/demand peaks and troughs notwithstanding. This reinforces the importance of developing more local markets, whereby value-added can be retained within the county and amongst the fishing community (IF: Interviewee 9). In order to be resilient, more fishermen need to use modern technology and sell direct to the consumer. It is happening to some extent (as shown below), but there are instances where fish merchants have been known to say "'if you sell direct, we will never ever buy your fish again'; so for the fishermen involved it really is a leap of faith" to move from what they know (selling harbourside at the markets), to selling direct (Round Table 1).

For many fishermen, selling their fish at harbourside is all they really consider in terms of markets, judging that they do not really have the time to go and market the fish themselves, preferring instead to focus their energy on catching the fish in the first place. Nevertheless, there is evidence that more and more fishermen are seeking to access Cornwall's local markets, such as fish shops and pubs/restaurants as well through periodic/seasonal fish festivals; for example, the fish festival of Newlyn takes place annually on August Bank Holiday Monday. There is also increasing evidence of fishermen using social media to make direct contact with the markets for their produce and to cut out the middleman, not simply putting the fish on the auction market. In this respect, some of them now sell direct to London, pooling their resources and supplies of

fish to satisfy these niche markets (IF: Interviewee 1). One example of this approach to adding value through making direct contact with consumers is 'Dreckly Fish', involving a group of three Newlyn-based fishermen selling hake, herring and shellfish. Key to their approach has been the development of a website that is linked to Facebook and Twitter, using the Twitter name [@Drecklyfish](#). Tweeting what they are catching, while they are actually catching it, allows potential customers to track and bid immediately for their catch. This means that by the time the fishermen reach harbour-side, they have already sold their produce at a premium over the auction market. Over time, they have developed six key clients who buy from them, each of whom is based in or near London. They were helped in developing this business model by funding from the FLAG, which provided training as well as supplying them with computer tablets (CRRC 2016; IF: Interviewee 5). However, most of fishermen have no digital footprint at all¹⁰, which is something that the FLAG is trying to address through a project known as Get Fit for Fishermen. Its objective is to try and help fishermen and retired fishermen and their families to use the Internet. (IF: Interviewee 5).

There are a number of further interesting examples of initiatives in Cornwall intent on improving both market access and value-added for fish products in Cornwall. These involve a group of fishermen forming themselves into an association (South West Handline Fishermen's Association); the Cornwall Wildlife Trust's initiative to inform consumers about why they should buy Cornish fish in terms of its sustainability and quality (the Cornwall Good Seafood Guide); and an example of the approach taken by a Cornish fishmonger to promote and market what is special about Cornish caught fish. These three initiatives are briefly described in the following subsections.

4.3.1.1 The South West Handline Fishermen's Association (SWHFA)

The SWHFA represents more than 150 handline fishermen in SW England. Fishermen in the South West have been handlining for mackerel, pollack and bass for over 40 years, providing a vital source of income for many inshore fishermen. However, in recent years most mackerel caught is by large trawlers fishing off the North Scottish coast. Many of these vessels are capable of catching several hundred tonnes of fish in a single night. This increase in scale has had the effect of reducing the prices paid for mackerel, as well as had a significant impact on stocks. In contrast, mackerel caught by small vessels fishing with hand lines has a much lower impact on fishing stocks and arguably is much more sustainable. There is also no unwanted by-catch. The South West Handline fleet has a quota of 0.83% of the total UK quota for mackerel, or 1750 tonnes, whichever is the higher. In reality, the mackerel fishermen in Cornwall have not caught all their quota for many years. An average day's catch for a handline vessel is in the region of 100-200 kg of fish. Proponents of handlining argue that this way of fishing is inherently sustainable and should be protected and encouraged (SWHFA 2016), not least in terms of the social benefits that it can contribute to. Small boats handlining for mackerel will also fish for other species such as bass, as well as potting. "I do potting and handlining; you've got to have your eggs in two or three baskets really" (IF: Interviewee 6).

¹⁰ This is an issue similarly faced by farmers, where Defra estimates that 13% of farmers have no digital footprint at all.

A key strategy of the SWHFA is to promote the benefits of fishing in this way to the end consumer, which is done through their website and the use of numbered tags which are inserted in the gills or mouth by the fishermen (involving mackerel, bass and pollack), remaining in the fish until taken out by the end-user. The identities of the fishermen are also displayed on the website, further encouraging the end user to make active connections with the fish they are buying and to perhaps pay a premium price for it (SWHFA 2016). Although the quantities involved are likely to be quite small, the work of the SWHFA is intent on protecting the sustainability of this form of fishing and, in so doing, showing that catching fish can be in balance with the natural environment.

4.3.1.2 Cornwall Good Seafood Guide

The stated aim of this project is:

“To provide clear and accurate information to help us all make environmentally informed decisions when purchasing locally caught seafood... Our Cornish fishing industry is something we should all be proud of, but knowing what fish to buy is a complicated issue. This website aims to address this by supporting the industry, highlighting good practice, and encouraging locals and visitors alike to buy Cornish... Draw[ing] together all available information into one place to enable consumers and business to make their own well informed choice when choosing Cornish seafood” (Cornwall Wildlife Trust 2016a).

It is about reconnecting people with the seafood industry, demystifying some of its more complicated elements. The Cornwall Wildlife Trust, who has developed the guide, sees the fishing industry as a real opportunity to benefit the environment if properly managed and supported. As such they want to try and support sustainable fishermen in Cornwall, which includes helping them achieve better prices for seafood that has been sustainably harvested. In relation to shell fishing, apart from some concerns about the number of pots being used, this sector is felt to be sustainable. However, there are insufficient local markets for the fish that are caught, meaning there is a reliance on export markets which can fluctuate in terms of both demand and the prices obtained (IF: Interviewee 8).

The project’s website sets out both historical and current fishing practices within Cornwall. There is also a guide to the 60 or more species that are caught in Cornish waters, including a picture and description of each of the commercial fish species caught and a rating for each species in terms of its sustainability on a scale of 1 to 5. The scoring system used is based on an internationally recognised methodology devised by the Marine Conservation Society (MCS) (MCS 2016), in order to ensure that the ratings used are comparable. The criteria used are based on five different elements of sustainability (Cornwall Wildlife Trust 2016a):

- Exploitation or stock status.
- Biological vulnerability of the species.
- Management practices, including checks and enforcement measures.
- Capture method and ecological effects.
- Certification or accreditation.

There are extensive fish recipes, as well as brief biographies of a number of the fishermen involved. There is also an interactive map of Cornwall that shows where to find and buy Cornish

seafood. The outlets highlighted include: wholesalers, restaurants, pubs, cafes, hotels, fishmongers and direct from the fishermen themselves. Developments in the management practices and capture methods used are also explained in some detail, demonstrating how the fishing industry in Cornwall is attempting to ensure that it is environmentally sustainable, both in terms of the fishing industry itself but also more broadly in terms of the marine environment. The result is an information portal that enables transparency for those interested in buying Cornish seafood. In this respect, it is clearly a very useful resource, although it is too early at this stage to assess the extent to which it has had an impact in terms of facilitating market access for those involved, or enabling better prices to be obtained.

4.3.1.3 *The Cornish Fishmonger*

The Cornish Fishmonger is a specialist family-run fishmonger which aims to "always source and provide the finest fish and freshest seafood, sourced from local inshore boats wherever possible". They are fully committed to supporting local fishermen and working with them to ensure the long-term sustainability of both fish and fishing within Cornwall. They buy daily from local fishermen, as well as from the markets at Newlyn, Plymouth, Brixham and Looe. They aim to provide as much information as possible to consumers, so that they fully understand the nature of the product they are buying (The Cornish Fishmonger 2016).

4.3.2 *The processing sector and its role in the market for fish*

The seafood processing sector in the UK is becoming more concentrated. In the period 2008-2014, the number of processing units declined by about 34%, reaching 333 units; this was counterbalanced by a 33% increase in terms of the numbers employed in each unit. The total number of processing units in the South West of England in 2014 was 40 (24% less than in 2008), employing about 1,534 people (Yordanova *et al.* 2015).

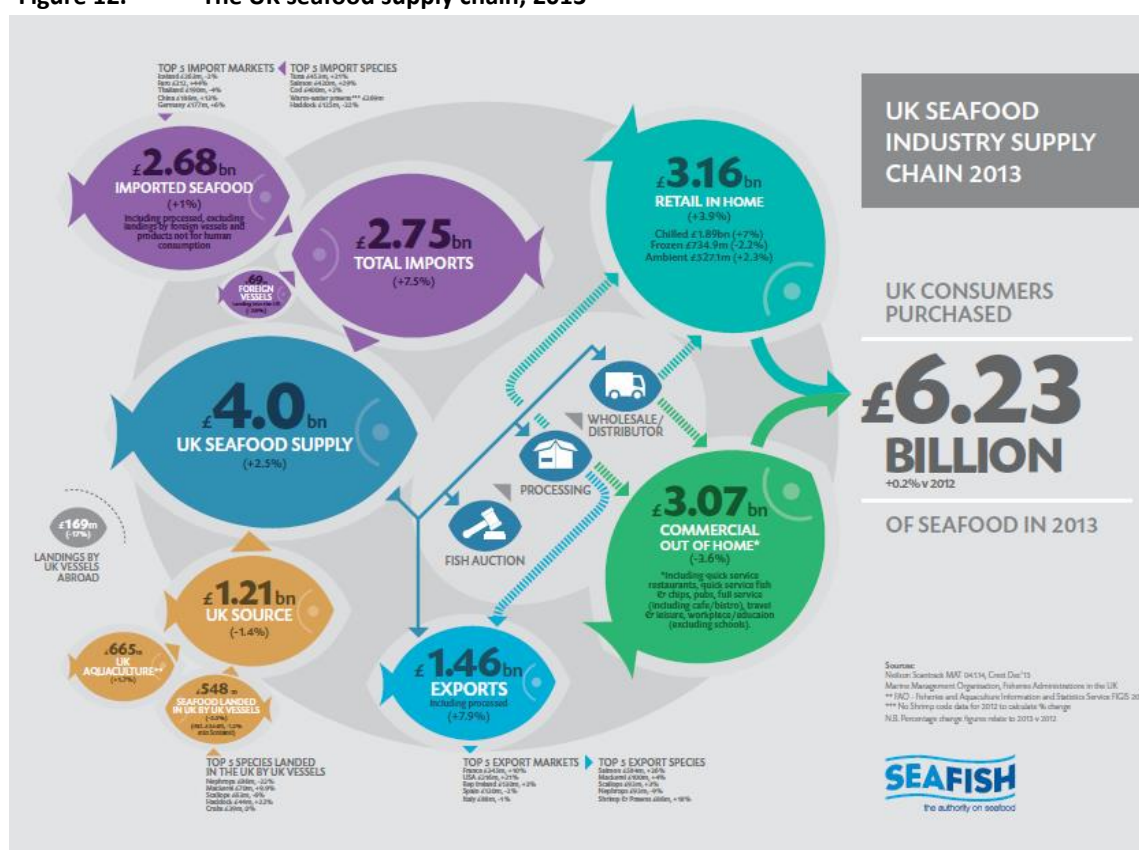
The total annual turnover of fish processors in the UK in 2012 was estimated at £4.2 billion, a 16% increase since 2008. In 2012, the average turnover per unit was £12 million, up by 69% since 2008. Large seafood processors generate 56% of the industry turnover. Spending on raw materials is the largest cost for seafood processors, representing about 70% of total costs. These costs are not fully passed on to consumers, potentially reducing profitability. Investments in the seafood processing industry focus on enhancing production efficiency, increasing production capacity and gaining access to new markets. Therefore, key areas of innovation are product and process innovation and marketing innovation (Yordanova *et al.* 2015).

The market conditions within which UK processors operate change, depending on the seasonal availability of species, prevailing weather conditions and consumer demand. Consumer demand is typically higher during the Christmas and Easter periods, yet lower at the beginning of the year. The weather also influences consumer demand in terms of the types of products, with demand for shellfish products tending to be high during periods of good weather, when correspondingly the demand for fish and chips may suffer. End-consumer demand can also change as a result of marketing campaigns and celebrity chef endorsements (Yordanova *et al.* 2015).

The main negative conditions that sea food processors highlighted in a survey conducted by Yordanova et al. (2015) in 2014-2015 are: unpredictable supplies and increasing prices of raw materials; regulatory and trade developments such as exchange rate movements; a lack of consumer awareness; skills shortages; securing finance; and retailer pressure on suppliers. At the same time, the survey highlighted some positive conditions that included a growing demand for seafood.

The discards ban and landing obligation are not only a source of uncertainty for fishermen, but also for processors. The fact that it is still unclear how the landing obligation will affect the catching sector (and therefore the supply of raw materials) is creating difficulties for the long-term business planning of processors. The main threat seen in the landing obligation, from the processors' perspective, is the potential disruption to the supply of their raw materials; partly due to the reduction of fishermen's profits and their consequent exit from the sector, and partly because some of the fishermen's quota will inevitably be taken up with non-target fish, reducing the quantity of targeted fish caught and therefore available to buy. However, there are also some potential opportunities from the landing obligation, such as an increase in the supply of fish which would otherwise have been discarded.

Figure 12. The UK seafood supply chain, 2013



Source: Seafish (online)

4.3.3 Public and private seafood standards

Food safety standards present both challenges and opportunities for producers. They can provide access to large and lucrative markets, but can also require significant up-front and

ongoing investments in both technology and other processes, which is a particular challenge for smaller producers and for those without easy access to capital (Bellmann *et al.* 2016).

In order to put the fish that have been caught on the market, the EU and national governments require some minimum safety standards. Public standards for seafood products are concerned mainly with traceability and product labelling, contaminants content and illegal fishing. The most recent traceability rules were introduced by Regulation 1224/2009, which requires that detailed product information is available and that the product is traceable throughout the food chain (OCEANA 2015; Yordanova *et al.* 2015).

The labelling of sea fish products is mandatory, as defined by the Common Organisation of the Markets Regulation 1379/2013 (CMO). The information that must appear on the labels of fresh or frozen fish is:

- Both the commercial and scientific names of the fish. These names must match those on the official list drawn up and published by each EU country;
- The production method using the designations: 'caught ...'; or 'caught in freshwater ...'; or 'farmed ...';
- The catch area;
- The fishing gear used among the categories: 'seines', 'trawls', 'gillnets and similar nets', 'surrounding nets and lift nets', 'hooks and lines', 'dredges', and 'pots and traps';
- Whether the product has been defrosted;
- For live bivalve molluscs, the 'best before' date can be replaced by the label 'these animals must be alive when sold';
- Information on allergens on the packages, or in the sale premises if unpacked.

Many of the new terms used in the CMO have required interpretation at an EU level, causing difficulties in terms of compliance and potentially creating issues when exporting products from one MS to another (Yordanova *et al.* 2015).

Contaminant limits are of particular concern with crabs. Crabs may contain relatively high levels of cadmium in the part of the flesh known as brown meat. The European Commission has decided that setting cadmium limits on brown meat is inappropriate because consumption patterns vary widely between consumers in different member states. For example, UK consumers prefer the white meat and consume relatively small amounts of brown meat, so that their exposure to cadmium through this route is small. In this respect, national advice is expected shortly from the Food Standards Agency. Other countries that import crabs from the UK may set limits for crab meat without distinguishing between the white and brown meats. As a result, this may cause problems for UK exporters (Yordanova *et al.* 2015).

Standards in relation to illegal fishing are ruled under the EU's Illegal Unreported and Unregulated Fishing Regulation (Council Regulation No.1005/2008), which came into force in 2010. The proportion of illegally caught fish consumed in large markets can be substantial, hence the Regulation provided that all the fish imported into the EU must be accompanied by a catch certificate verified by an authority of the vessel's flag state. The EU can block fish imports from non-cooperating flag states. For example, Belize, Cambodia, and Guinea were declared "non-

cooperating” in November 2013 and a ban on imports of fishery products fished by vessels under their flags was imposed (Bellmann *et al.* 2016).

Public standards from the EU, or from other national governments, are increasingly being supplemented by private safety and traceability standards from corporate retailers. This is a result of the increasing importance of large food retailers in the supply chain and of increasing vertical integration in which independently certified private food safety standards provide verifiable quality assurance to companies. Private standards for seafood products can be private safety standards (similar to the public ones, but mainly intended to gain access to a particular supply chain rather than market access as a whole), or sustainability standards (Bellmann *et al.* 2016).

Sustainability standards have initially emerged in a number of developed country markets, partly as a reaction to the perceived failure of national governments to properly manage fisheries within their EEZs. Many different private standards are used by a wide range of players, from fishers to processors, traders and wholesalers, across a very heterogeneous industry. This heterogeneity in private standards reflects the proliferation of pocket guides to sustainable seafood issued by different environmental groups (Bellmann *et al.* 2016).

The two largest sea fisheries certification schemes are Friend of the Sea (FoS) and the Marine Stewardship Council (MSC). Together, they cover about 18% of global sea fisheries production. Other schemes (for example, KRAV in Sweden and Naturland in Germany) provide certification for organic aquaculture and small scale sustainability certification schemes for fisheries (Bellmann *et al.* 2016). The impact of private sustainability standards on fish production is context specific. The costs of acquiring and maintaining certification vary significantly depending on: i) the dimension of the business involved; ii) the amount of pre-existing information; iii) the type of certification requested. Independent third-party MSC certification can cost up to €250,000 (see below), while simpler FoS certification schemes cost around €2,000. Some governments (e.g. the Netherlands and New Zealand) provide financial assistance to help their fishing industry obtain certification. The largest cost element of a certification, however, remains the underlying cost of managing the resource sustainably (Bellmann *et al.* 2016).

The economic benefits of sustainability certification remain uncertain. From the point of view of retailers they can result in price premiums and increased consumer trust, but for fishers it seems that the only benefit is access to certain supply chains, without necessarily obtaining significant price premiums on the catches concerned (Bellmann *et al.* 2016).

4.3.4 Sustainable seafood and certification

The cultural politics around ethical food choices has become ever more complicated, involving the contestation and negotiation of what can be understood as 'good' or 'bad' food choices. In relation to fish, the term 'sustainable' also has many meanings, although Brinson *et al.* (2011, p. 547) suggest that: “Sustainable seafood may be described as products that have high stock abundance, low levels of fishing pressure, nominal bycatch levels, minimal adverse gear effects, negligible habitat damage, or effective management”. However, fish/fisheries tend to be regarded primarily as natural resources, rather than as sources of food as such. In this respect, "food security for fisheries is most commonly discussed only in relation to maintaining viable

stocks of fish... without specifically addressing the broader 'food system'" (Olson *et al.* 2014, p. 105). As a result, management tends to be about ensuring the health of the wild stock of fish rather than focusing on the incomes of fishers themselves.

There is a strong political-economic dimension to contemporary fisheries management, which tends to favour large scale fish harvesting and processing. Since the 1990s, there has been a growth of third-party/private certification standards, most notably the MSC standards (described in more detail, below). Such schemes do not replace state led or EU fisheries management, but they do have an important role to play in seeking to view fish as food rather than as wildlife. Significantly, this suggests a change of focus from 'fisheries management' to 'sustainable seafood' (Silver and Hawkins in press). As Olson *et al.* (2014, p. 105) argue: "thinking about fish as food provides a different frame of interpretation" in terms of the management of fish, fisheries and the marine environment; not least because it enables individuals to demonstrate an awareness of the issues surrounding seafood and to take an actively responsible role in ensuring its sustainability.

The following subsections briefly describe three certification schemes that are of relevance within a Cornwall context: Marine Stewardship Council; Responsible Fishing Scheme; and Cornish Sardine Management Association. In some way, each of these schemes is intent on demonstrating to the end consumer that the fish caught under their label is sustainable.

4.3.4.1 The Marine Stewardship Council seafood eco-label

The Marine Stewardship Council (MSC) seafood eco-label emerged from a partnership between Unilever and the World Wildlife Fund, with the intention of promoting sustainability initiatives in relation to seafood. Critically, the MSC label developed as a non-state market driven governance tool, wherein corporations could see that it was in their own self-interest to protect the stability of their seafood supplies. Schemes such as the MSC also enable retailers to demonstrate 'due diligence' in relation to their sourcing and procurement policies. While consumers may not be directly involved in developing initiatives such as MSC, they are the ultimate recipients of seafood and can therefore have an influence. The intention of those involved in the sustainable seafood movement is to use retailers as gatekeepers of sustainability, through making sustainable seafood sourcing the norm. However, for this to be successful, consumers will need to be aware of why such products may be more expensive, or there is a danger they will not buy into the process. In this respect, it is important that financial responsibility for ensuring sustainable fisheries is shared fairly across the supply chain (Gutierrez and Morgan 2015).

The MSC label (Figure 13) has been criticised for being inaccessible to small-scale and developing world fisheries, as well as not leading to a measurable reduction of fish stock decline. As a result, some fishers have sought to go beyond minimum MSC standards, while NGOs have developed Fishery Improvement Projects (FIPs) as a means of enabling those fishers not currently able to achieve full MSC certification to access markets. In other words, there is now an MSC plus and an MSC minus, both of which are beyond the control of the MSC. This potentially creates a crisis of credibility as well as confusion. In addition, if retailers across Europe achieve their aim of only selling MSC certified fish, its use as a means of differentiation diminishes and consequently its ability to attract a price premium. If this becomes the case, retailers and fishers will need to

consider other ways to add value, in that it is critical price premiums are achieved in order to cover or exceed any additional costs that may be incurred by providing fish that have been more sustainably caught and sourced (Bush *et al.* 2013).

Figure 13. MSC Label



Within Cornwall, line mackerel was originally MSC certified, paid for by grant funding. However since the grant funding disappeared, the association no longer had the resources available to ensure continuation of the accreditation. MSC certification also involves complete fisheries, rather than individual species. There are concerns that it is a top-down approach driven by environmental NGOs putting pressure on supermarkets who are worried about their reputation. At best, it simply allows access to large-scale retailers for fishermen, but does not add value to their catch (IF: Interviewee 1). As such, at least from an inshore fishing perspective, it is of little value or relevance.

4.3.4.2 The Responsible Fishing Scheme



The Responsible Fishing Scheme (RFS) is a voluntary vessel based programme that has been developed to raise standards in the catching sector, enabling those within the seafood supply chain to demonstrate their commitment to the responsible sourcing of seafood. The RFS provides tangible evidence that the seafood landed by a vessel has been responsibly harvested, handled, and preserved to industry agreed best practice standards. It is intended to complement other certification schemes and to contribute to the ongoing sustainability of the fishing industry. It is the only global standard (developed and administered in the UK) that audits compliance on board fishing vessels, including ethical and welfare criteria. It is independently audited and demonstrates that a vessel and its skipper are operating to best practice in five core areas (Seafish 2016):

- *Safety, health and welfare* (including a commitment to generating a culture of integrity and respect towards labour).
- *Training and professional development* (including improving skills, knowledge and understanding).
- *The vessel and its mission* (including ensuring that the vessel complies with all current legislation).
- *Care of the catch* (including a commitment to maintaining the value of the catch and on supplying a safe, high quality product with known provenance).
- *Care for the environment* (including respecting the environment and supporting fisheries science through the allowance of observers on board).

The scheme underwent a comprehensive review in 2014. It was developed in accordance with the requirements of internationally recognised standard ISO17065 and was re-launched in January 2016. The costs of annual certification are in the order of £100 per vessel, making it much more affordable than MSC certification (albeit the latter is based at the level of a whole fishery, rather than individual vessels).

A good example of how the RFS is helping to promote and develop the quality of the fish processing industry within Cornwall is the Real Cornish Crab Company (RCCC). RCCC has now been trading for 20 years, supplying crab to both local and international markets. The crab is landed from the company's own vessels in Newlyn harbour, direct to the factory. There are four boats involved, each of which is a vivier crabber, which means that it has a large tank below decks that is continuously circulated with fresh sea water, thereby ensuring that the crab is kept fit and healthy when it is landed. The RCCC website highlights that they are members of the RFS scheme and that this signifies they are actively contributing to sustainable and traceable fishing practices. This includes what the company calls 'Crab-trax', which is a programme that allows customers to scan a code on the packaging of the crab they have bought and to trace where their crab was caught (RCCC 2016).

4.3.4.3 Cornish Sardine Management Association (CSMA)

In 1993, EU legislation came into force that protected food names on either a geographical or traditional recipe basis. The intention was to highlight regional and traditional foods whose authenticity and origin can be guaranteed. The resulting certification can help increase consumer awareness about the products involved, as well as setting in place particular management mechanisms. In 2004, the CSMA came together as a group of Cornish fishermen and processors to agree common standards between themselves for catching, processing and marketing Cornish sardines. As part of this process, they managed to obtain a Protected Geographical Indication (PGI) certificate, which covers Cornish sardines (*sardina pilchardus*) that have been caught up to 6 miles off the Cornish coast and that furthermore have been landed and processed within the county of Cornwall. The characteristics of the Cornish sardine are linked to the geographical area on the basis of the traditions associated with catching and processing. Fishing for Cornish sardines is a vital part of Cornwall's heritage. The skill of locating and catching the fish has a long history in Cornwall, having been handed down over many generations. (SMA 2016)

It is a requirement of the PGI that skippers and owners record and submit details of their catch to the IFCA, in order to evidence that the product was caught within the requisite geographical area. Cornish sardines are brought aboard from drift or ring nets, before being iced to maintain quality and freshness. Once landed, the sardines are sold to fish merchants and processors either through auction markets or directly to merchants/processors (with the fishermen recording which processors have bought their fish in order to ensure further traceability throughout the supply chain). The fish can then be processed in several ways, but primarily through a combination of filleting, heading, gutting, salting, marinating, freezing and packing (SMA 2016).

The aim of the CSMA in achieving PGI certification has been to both manage and develop the catching and marketing of Cornish sardines. The resultant reputation of Cornish sardines over the last 10 years has been associated with a high quality product that has achieved an increasing volume of sales, particularly in the UK retail market. Cornish sardines are now found on sale at the fish counters of a number of major UK retailers such as Waitrose, Tesco's and Marks and Spencer (SMA 2016).

4.3.5 Community supported fishing programmes

Through the growing number of certification schemes, consumers are beginning to have a greater influence on how seafood is harvested and marketed through their purchasing choices. However, most certification programmes offer universal standards for the global consumer based on entire fishing stocks (notwithstanding those described above); this risks failing to recognise local fishing activity that may be highly sustainable at a local level, both in ecological and social terms. In this respect, the development of Community Supported Fishing (CSF) schemes has potential, in that there is a more direct relationship between individual fishers, the fish they catch and the end consumer (Olson *et al.* 2014).

They are a relatively new phenomenon, having originated in the fishing town of Gloucester on the East Coast of the USA in 2010. They function in very much the same way as Community Supported Agriculture (CSA) schemes, wherein consumers are encouraged to more directly engage with the food they eat. The main purpose of CSF is to increase the profits for local fishermen, while at the same time providing high-quality and very fresh seafood to consumers. CSF have the potential to enable fishers to sell their fish at a premium price; to provide a market outlet for species that may have a low commercial value when sold through traditional outlets; and thirdly, they can have a part to play in stabilising the incomes of fishers. CSF also facilitate direct traceability of the catch, thereby differentiating it from any other fish on the market. In this respect, direct contact between the fisher and the consumer allows for greater explanation and understanding of the fish that have been caught. However, they do require an investment in start-up costs such as marketing, promotion and distribution, as well as involving a new set of skills (Brinson *et al.* 2011).

In Cornwall, there was some enthusiasm for developing a CSF scheme following the intervention of the marine biologist and television presenter, Monty Halls, as part of his TV programme entitled 'The Fishermen's Apprentice' in 2012. Monty visited the CSF scheme in Gloucester, USA and tried to develop something similar with the fisherman at the port of Cadgwith, Cornwall. However, despite some initial enthusiasm, it proved to be too much commitment and extra work

for the fishermen involved, whose energies were more focused on actually catching fish, rather than marketing it. As a result, it failed to get off the ground even though there was evidently some consumer support for it (Halls 2012).

4.4 Key CSP identified in the literature, media and interviews

As identified by van de Walle *et al.* (2015, p. 373) in the literature, it is apparent that “primary activities based on the marine environment are under increasing pressure from both external factors...and internal factors...that threatens their future sustainability”

Some of the key issues identified within this report are shown in the form of a SWOT table, below. The text following then draws out the significance of these issues in more detail, highlighting what needs to be examined further as part of Task 2.3 (focus groups and workshops), as well as Task 2.6 (primary producer survey).

4.4.1 SWOT analysis

Table 3. SWOT analysis – fishing

Strengths	Weaknesses
Diversity of fish species caught	Quota availability and fish stocks
The number of inshore fishing boats	Seasonality of the tourist trade
A significant tourism spend on food	Bad weather prevents small boats going fishing
Active fishing harbours as a critical tourist draw	Succession issues
Established export markets	Costs of boats, licences, quotas etc.
'Cornwall' as a strong regional identity brand	Problems securing loans
Opportunities	Threats
Newlyn harbour development	Increasing costs (e.g. diesel) and stagnant prices
Recovery of fish stocks/more quota allocated	Ever more stringent quota allocations
Growing consumer awareness	An increase in regulation (e.g. MPAs, discards)
Developing markets/demand	Succession: lack of skills and new blood
Working together for sustainability in Cornwall	Increasingly intense weather patterns
Brexit	Brexit

4.4.2 Policy and regulatory conditions

- The first issue to come up in any conversation with those interviewed as part of this case study were restrictions on the amount of fish that can be caught due to an insufficient quota allocation. The focus here is on inshore fishermen, but this issue was recognised as affecting all fishermen, whatever their size.
- One area of debate about the future of fishing in Cornwall is the reliability of the scientific evidence used for calculating quota (and at an EU-level the TAC for each MS). The decisions about quota are made in Brussels and are highly political. Anecdotally at least, fishermen very often say that there is more fish available than the science indicates.
- There is a need for more accurate science on fish stocks. This requires greater funding for research, as well as greater cooperation from some fishermen. Some fishermen do allow scientists on board their boats, but others are resistant to the idea. Fishermen and scientists need to work together to further improve the data available.

- The recently introduced 'landings obligation' is seen as well-intentioned. It has the potential to reduce discards, but at present has not been fully thought through in terms of how to market or deal with all the fish that are landed.
- Another issue with the landings obligation is what is known as a 'choke' situation. What this means in practice is that if a fisher has fully caught their quota for one species before catching all their allocated quota for another species in the same sea area, the vessel concerned will have to stop fishing in that sea area because they cannot guarantee avoiding the species for which they have no quota left, even though they may be intent on catching another species for which they still have quota.
- The recent capping of many of the smaller inshore fishermen through addressing what is known as 'latent capacity' is a cause of concern for many involved. The intention is to maximise the catch capacity of the inshore fishing fleet, but in the process the flexibility of many smaller scale fishermen has been severely curtailed, potentially threatening their viability.
- Quota used to be 'publicly' owned, but has become tradable and thereby effectively privatised. There is concern in Cornwall that quota allocation will be bought, and indeed is being bought, by fishing boats that are not Cornwall-based. There are attempts to buy up quota to help protect the future of local fishermen.
- Non-quota species, particularly shellfish (crab and lobster), are crucial in helping to ensure inshore fishers viability. There are concerns that in some instances the stocks are being overfished. Initiatives, such as seeking to limit the number of pots per boat, are being talked about. In addition, size restrictions are also in place.
- The scale at which decisions are taken is clearly an area of concern. Some of the interview respondents suggested that the one size fits all approach of the EU is simply not appropriate, especially in relation to the small-scale inshore fishing fleet. In this respect, the Brexit negotiations may be an opportunity to reconsider how fishing is organised. In reality, there is a perception that most of the existing CFP regulations will need to remain the same. The one area that might change is in relation to the six and 12 mile fishing limits. Off the coast of Lands End, national fishing limits may also be extended to 200 miles.
- A sustainable fishing industry is crucial to the ongoing viability and well-being of the Cornish economy. This is partly in relation to the income and employment it generates directly, but perhaps even more importantly in terms of contributing to the very significant tourism industry. Its future sustainability is therefore something that a wide range of organisations are keen to protect and ensure.
- The inshore fishing sector, in particular, is critically important in social terms. It supports many small-scale businesses, as well as a large number of fishing communities and ports. Social support is not something that has been well supported from the EU level. A key question in this respect is: should support be targeted at a sector level, or territorially? The local FLAG has an important role in supporting the fishing industry, particularly the inshore fishing community. In this respect it is support at a sector level, which has territorial benefits.

4.4.3 Recruitment and succession

- Recruitment and succession is a big issue in the Cornwall inshore fishing industry. Traditionally, boats and know-how have been passed down from father to son; however,

this is happening less and less, as the economics around fishing mean that it has become a less attractive career option. It has become very expensive to get into fishing, with high prices for boats, but also licenses and quota, assuming that there are any licenses and quota available to be purchased.

- The average age of fishers has been rising steadily to about 60, which is in line with farming. There is a recognition that new blood needs to be encouraged to come into the industry. Some educational qualification schemes have been introduced, but fishers tend to be suspicious of these, preferring instead young people who have had actual experience. Yet, getting this experience is difficult: many of the smaller boats have adjusted their practices to be single-handed boats, and most boats have sought to reduce the number of deckhands.
- Crewing and skippering are the two traditional ways of accessing the fishing industry, both of which are now problematic for those seeking to enter the industry.

4.4.4 Finance

- Another factor that makes it difficult for younger fishers to get into the industry is a lack of finance. Unlike a farmer who owns their land, fishermen own a depreciating asset -- their boat. Banks will not lend against quota. In order for a fisherman to gain access to finance, they have to prove a good track record. This requires experience, etc. Access for aspiring fishers is therefore problematic.

4.4.5 Market conditions

- The most important factor in relation to market conditions is that inshore fishers must in some way add value to their catch, or they are going to really struggle to remain viable in the long term.
- Inshore fishers will tend to land their fish every day, meaning that they have the potential to be the freshest fish available and thereby receive the best prices for their catch; however, they do need to look after the fish they catch in order to achieve these prices.
- Traditionally, most fishers have marketed their fish through the auction markets, mainly in Newlyn, Plymouth and Looe. This means they have to accept the price that is achievable on the day. When there are a lot of fish caught, the price goes down and vice versa. In this kind of market, they are very much price-takers.
- Some fishers have contracts with wholesalers, which can help even out the peaks and troughs.
- More recently, fishers have been turning to social media to try and improve their direct contact with the end consumer, thereby achieving better prices. Others have made contact with local restaurants and so on.
- One of the key issues in developing the market for fish, is to raise consumer interest and understanding of what is available. There is a suggestion that this is starting to happen but could be encouraged further.
- In many instances, fishers in effect cannot be bothered to market their fish. They are more interested in catching it. The evidence would suggest that this attitude needs to change.
- The FLAG has invested money in trying to support the better marketing of fish and fish products. This is particularly in relation to trying to maximise the opportunities offered by the huge influx of tourists into Cornwall every summer.

- Certification schemes, such as MSC, may facilitate access to supermarkets, but are too expensive for small scale fishermen and fisheries. The development of more localised certification schemes may help to differentiate Cornish fish.
- The recent, and ongoing, introduction of the landings obligation has yet to be fully worked through in terms of the market/marketing implications.

4.4.6 *Environmental issues*

- There is an increasing number of MPAs. There is discussion that some of these may be 'no-take' areas, although there are none of these at present. Fishermen tend to fear that MPAs will restrict their rights to fish in certain areas. In reality, most are unlikely to affect inshore fishermen, especially not those who are fishing for shellfish.
- Static gear fishermen, such as those fishing for lobster and crab, are likely to do very little damage in environmental terms.
- Even those whose main role is to protect the environment can see the benefits of working with and supporting the fishing industry. There is recognition that the inshore fishing sector (rather than the bigger boats) probably does less damage in most instances, but that there is a need to have both inshore and offshore fisheries.

4.4.7 *Tensions between the inshore and offshore fishing fleets*

- Those most directly involved with inshore fisheries argue that it is inherently more sustainable than the over 10 m fleet, and is therefore worthy of particular protection (something that came out strongly in the media analysis). However, there is also a view that the whole Cornish fishing fleet should be looked at together (rather than separately) when considering the sustainability of fishing in Cornwall. The key argument here is that there is a natural resource that needs to be looked after, but also exploited in order to harvest the resource available. The inshore fleet alone would be unable to catch all the quota available. For example there is 800 tonnes of Megwin quota available, which is sustainably caught by a fleet of 15 beam trawlers. If beam trawling was banned, it would not be possible to exploit this resource.
- This tension is encapsulated in the following quote from the media analysis:
 - "Barry Deas, Chief Executive of the National Federation of Fisherman's Organisation, which represents the interests of both inshore fishers and larger-scale industrial vessels, argued that "it was "sheer nonsense" to say the larger vessels were unsustainable" and noted that "[m]any of these vessels fishing large shoaling offshore stocks like mackerel and herring are operating in exceptionally well managed fisheries... If these pelagic quotas were reallocated to the inshore fleet, they would remain uncaught" (The Independent, 25th January 2015, Serina Sandhu)."

4.4.8 *The sustainability of inshore fishing in Cornwall*

- Looking to the future of inshore fishing in Cornwall, there are clearly concerns that the sector is under pressure. "I can see the smaller harbours not having boats working for them... So I can see some of the smaller places becoming just tourist harbours... I can't see that being reversed unless there is some sort of change in policy to support small-scale fisheries" (IF:

Interviewee 1). Key to the future of inshore fishing in Cornwall is flexibility, as summarised in this quote:

- “They need flexibility, to be able to target what is there at the time. So when there is an abundant fish stock there, at the level that they take it, I see no reason why they are restricted to some of the very small quantities that they have... You can just imagine how you'd feel if you knew there was fish there, you could make a living, but you're stopped from going out there to make a living, and in the grand scheme of things, the quantities that they would take pales into insignificance compared to the bigger boats, which perhaps have more opportunity to fish elsewhere, go different places, and do other things, and target other species, which might be on a different ground, but for the small inshore boats, flexibility is key” (IF: Interviewee 3).

4.5 Understanding the potential for resilience

Understanding the potential for resilience of inshore fishers (and primary producers more generally) is a key outcome of this case study. As such, the notion of resilience needs to be understood within this context. The text below has been drawn from extant academic literature, which provides some useful context and background on the issue.

Resilience can be defined as “the capacity of a system to absorb disturbances, to be changed and reorganised so as to still retain essentially the same identity” (Doeksen and Symes 2015, p. 328). While Tendall *et al.* (2015, p. 18) argue, that “resilience implies the capacity to continue providing a function overtime despite disturbances... thus form[ing] an essential part of what enables sustainability”. How individuals or firms do this will vary; in some cases there may be minimal adaptation, whereas in others there may be profound change. In this respect, there is likely to be a combination of 'resistance to change' and 'adapting to change' (*Ibid.*).

Over recent decades, fishing communities across Europe have undergone major structural change, principally through processes of modernisation, concentration and technological development that have led to a halving of fishing employment over the last 20 years. This is putting pressure on the long-term viability of many smaller fishing communities, leading to the loss of basic local services, a lack of affordable housing, and difficulties in recruiting crew members as young people are unwilling or unable to go into fishing (Symes and Phillipson 2009). Individual fishers and their families often struggle for regular income, in that they face a range of risks and uncertainties, many of which are beyond their direct control, including seasonality, severe weather, market instability and variability in terms of fish stocks. Against this backdrop, resilience thinking can provide a useful framework for understanding the ability of socio-ecological systems to adapt and survive in such “ever-changing, turbulent conditions” (Doeksen and Symes 2015, p. 327).

The risks faced by fishers have been compounded by management restrictions imposed through the CFP, principally in terms of combating overfishing. Key amongst these is the “curtailment of the concept of fisheries as a common property resource... [which] has seen the notion of free and equal access to fishing whittled away through restrictive licensing and quota restrictions” (Symes and Phillipson 2009, p. 2). Of critical importance to resilience is flexibility, which in relation to the inshore fishing sector involves the ability to target a range of different species

(through the deployment of multiple gears), to internalise costs where possible, to ensure they have low levels of indebtedness, to engage in pluriactivity (mainly through the fisher's spouse working¹¹), to embrace the ethos of self-employment, and to reduce crew size. Through these measures, small-scale inshore fishers and their households have shown remarkable levels of resilience and the ability to adapt to changing circumstances. However, adaptation may well involve trade-offs and difficult choices; for example, one adaptive strategy in response to declining catches is to fish further from shore and to spend longer at sea. While this may result in greater income, it also involves potentially more danger as well as spending more time away from the family. Where the negatives of an adaptation response outweigh the positives, it is known as 'maladaptation'; however, research suggests that it is only as a last resort that fishers will exit the industry, in that there is a strong attachment to fishing as a way of life often associated with self-reliance and a pride and passion for what they do (Coulthard and Britton 2015; Ross 2015; Salmi 2015; Symes and Phillipson 2009). As such, "the decision to exit the fishery was found to require both a necessity – a 'push factor' – such as financial unviability... and a 'pull factor', such as having a buyer for your boat", or simply wanting to have a more predictable lifestyle (Coulthard and Britton 2015, p. 282).

Salmi (2015) argues that key to understanding and enabling the future resilience of small-scale, inshore fishing livelihoods is the notion of 'post-productivist development' in coastal communities. Within this framing, it is necessary to acknowledge the increased complexity and diversity of uses and pressures that now confront coastal areas, over and above simply fishing, such as second home owners, tourism, and nature conservation. This requires a governance framework that allows for interaction, understanding and the development of synergies between fishers and other user groups that ultimately may contribute to the resilience of coastal fishers. This might include, for example, the direct sales of locally caught fish to tourists and local restaurants; or fishers making a specific contribution to the environmental management of marine resources. Crucially, "from a resilience perspective, future trajectories depend on the adaptability and transformability of the studied social-ecological system...building synergies between different user groups... and creating opportunities for the development of new forms of resilient fishing livelihoods ... [through] interaction and adaptive local governance" (Salmi 2015, pp. 270-271).

Despite the resilience and adaptability of many small-scale, inshore fishers, it is clear that many are struggling to survive. Symes *et al.* (2015, p. 251-252) suggest that while policy should help to build resilience in the fishing industry/community, in reality it has become one of the most potent sources of instability for fisheries. Underlying this have been neoliberal policies that have supported technical solutions, specialisation and economies of scale, to the detriment of traditional practices. In this respect, policy-making is often associated with being "top-down, distant, centralised and lacking local specificity... blamed for undermining the autonomy and flexibility required to fish sustainably" (Ross 2015, p. 318) and, in the process, alienating many inshore fishing communities who tend to be suspicious of 'policy' and 'science', which are

¹¹ "Strategies that women in fishing households adopt can be roughly categorised into 'endogenous strategies' where women's work remains within the family fishing business, a role that is commonly referred to as a 'Shore Skipper' (for example helping to maintain nets and keeping the business accounts), and 'exogenous strategies', where women work outside the business to supplement income from a non-fisheries source" (Coulthard and Britton 2015, p. 284).

perceived as external or outside interference. Flexibility is seen as a key attribute of fishing sustainably and regulation is seen as "reducing the scope for fishermen to practice many of the attributes associated with being a good skipper, such as using local ecological knowledge to determine what to fish" (Ross 2015, p. 319). The data used by scientists to determine policy is often seen as inappropriate at a local level, as well as ignoring local knowledge of the fish stocks available. Ross (2015) argues that if science and policy wants to ensure both sustainable fisheries and resilient fishing communities, then it needs to enable localised adaptive strategies and to respect the perspectives of those involved, both in ecological as well as social terms. This necessitates devolving responsibility for managing coastal fisheries to the local and regional level, as well as providing structures that enable interactive governance and buy-in at a local level, thereby enabling synergy between the various uses to develop and resilience to be built.

4.6 Cornwall inshore fishing sector - focus groups and workshop

This section reports on the findings of three focus groups and one workshop that were conducted as part of task 2.3, with the intention of complementing and building on the findings of task 2.2.

A series of *three focus groups* were held with Cornish inshore fishers over the period between December 2016 and January 2017. Details of the numbers of fishers involved in each case and a brief synopsis of their socio-economic data are given in appendix 2. The main purpose of conducting these focus groups was to complement and build on the analysis of regulatory and market conditions reported above under sections 4.1-4.5 above, in order to provide an insight into the perspective of the fishers themselves (more broadly within the wider Sufisa project, the primary producers of food). Critically, although the focus groups were composed of individual fishers, analysis of the data is intended to elicit understanding of the wider inshore fishing sector within Cornwall, rather than simply of individual fishers.

Helston focus group



Padstow focus group



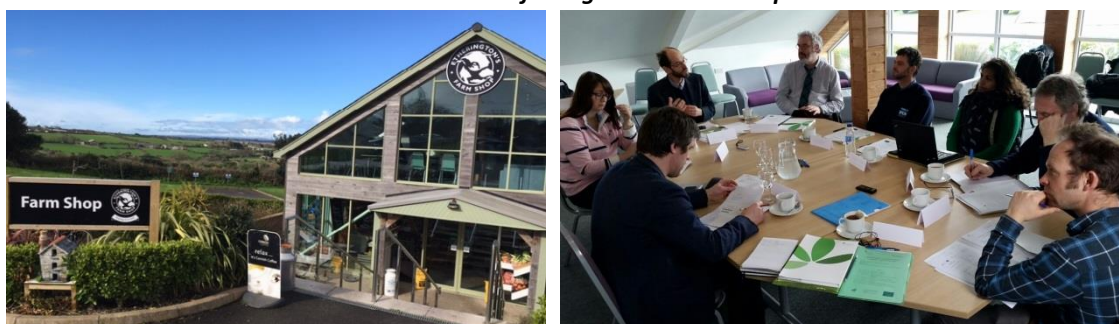
Each of the focus groups lasted approximately 1.5 hours and was digitally recorded for later verbatim transcription. A total of 106 pages of data were transcribed. In terms of their individual comments, anonymity was promised to the participants. As such, any direct quotations that are used in this report refer simply to the relevant focus group, rather than to any individual fishers. The focus group schedule was divided into seven different sections, details of which are given in appendix 3.

The *workshop* was conducted in March 2017, following reflection on the focus group data, with two main aims. Firstly, to present the key findings of the research conducted as part of task 2.2,

together with the focus group findings, to a range of stakeholders from the fishing industry and to get their feedback and comments on it. In so doing, the focus of the research findings could then be sharpened as, effectively, they were 'ground truthed' by those at the workshop. The findings from the focus groups were reported under seven key areas (see below), which were then presented to those at the workshop for feedback and comments. In part due to the relatively small number of people at the workshop, it was possible for the presentation to be informal in nature and to allow the participants to make comments at any point. This led to a very participatory and interactive meeting that was both productive for the research team, and clearly enjoyable for the attendees (judging from their feedback comments, reported as part of WP5). It also means that it makes sense to include the workshop comments as part of the reporting of the focus groups data under section 4.6, below, rather than as a separate section.

The second aim of the workshop was to develop a range of scenarios regarding the future viability of the inshore fisheries sector in Cornwall, which was inevitably linked to the Brexit negotiations. This part of the workshop was intended as a precursor to the work that will be conducted under WP4 in terms of developing solutions and scenarios more generally, with the aim of improving the sustainability of primary producers (in this case inshore fishers in Cornwall). As such, it is reported as a distinctive section from the other workshop and focus group data: section 4.7.

Cornwall inshore fishing sector Workshop



The workshop lasted for four hours and was digitally recorded for later selective transcription, which resulted in a 52 page transcript of the discussion. The agenda for the workshop is available in appendix 4, but involved presenting the focus group findings before a break for lunch, and developing the scenarios after lunch. There were a total of nine people at the workshop, four of whom were part of the research team. 22 people had been invited, so the number was slightly less than hoped for, but those who did attend are pivotal to the inshore fishing sector in Cornwall. Having a relatively smaller number of people at the meeting also meant that everyone there was able to have their say, and the resultant discussion was both vibrant and insightful. Details of those who attended are given in appendix 5. As with the focus groups, anonymity was promised to the participants, meaning that any direct quotations used in this report are given a number (e.g. WSP 1, where WSP means 'workshop participant'), rather than identifying any individual participants' names or affiliations.

Analysis of the focus group data revealed that there were seven key areas that required further examination, and these structure this section of the fishing report, as well as the presentation that was given at the workshop. The seven key areas are as follows:

1. Reasons for going fishing

2. What is distinctive about inshore fishing
3. Markets and marketing
4. Quota
5. Policy and management
6. Resilience and the future
7. Brexit

4.6.1 *Reasons for going fishing*

Discussions at the focus groups revealed that fishers are passionate about what they do. Most of those present had been involved in fishing since they were teenagers, often being introduced to fishing by their father. They love fishing and do not want to do anything else. This is significant within the context of this research, in that they are likely to carry on fishing until the bitter end, enduring difficulties that those involved in other livelihoods might find too much. In this sense, they are innately highly resilient and will endeavour to find a way to overcome any problems they might encounter in terms of their continuing business viability. This passion is encapsulated in the following quote:

“It's just what I've done. It's not a job; it's a way of life. It's salt water coursing through these veins and it always will, you know. I don't make a fortune, but I make a living. I love going to sea and I love doing what I do. I fish.” (Newlyn FG)

4.6.2 *What is distinctive about inshore fishing*

Four issues in particular emerged from the discussions. Firstly, that inshore fishing is highly localised; secondly, that it operates at a relatively small-scale; thirdly, that it is inherently ecologically sustainable; and fourthly, that there is a need to more appropriately categorise what is meant by inshore boats. Each of these requires further explanation.

4.6.2.1 *Highly localised*

In terms of being *highly localised*, the smaller inshore boats tend to fish within six nautical miles (6nm) of the coastline, although those with a larger engine/deck size may venture further out. Because by and large they are restricted to a relatively confined geographical area, the smaller inshore boats are effectively embedded in their local environment, giving them an incentive to look after the fishing grounds in their immediate area. This sentiment was sometimes expressed in relation to larger, more nomadic fleets of boats which may have less connection with, and incentive to look after, their local area/fishing grounds. This is encapsulated in the following:

“We see ourselves as stewards. We've got to look after the ground because we can't travel very far. Then you've got these nomadic fleets that are like locusts. They've no interest in preserving anything in any given area, because they are going to move, and they keep moving. The scallopers, the beam trawlers, they just come through. Some of these big crabbers, you know, they are working thousands of pots.” (Padstow FG).

4.6.2.2 Scale of operation

The *relatively small scale of operation* of inshore boats is also seen as being significant. The quote above talks about some of the bigger boats working thousands of pots (which may be either for crabs or lobster), whereas traditionally a small boat would put out between 300-400 pots. This is relevant in terms of employment and the impact on the ports and communities that they fish from. In this respect, a large boat may employ four crew but catch as many fish as 50 small boats, which average perhaps 1.5 people per boat, making a total of 75 people. The smaller boats are also significantly limited by the weather conditions meaning that their number of fishing days per year will be limited, particularly on the north coast where the sea conditions tend to be rougher. In contrast, the larger boats are much less restricted by weather conditions and can fish almost every day of the year, if they so choose.

The scale of operation also begs the question as to what is the main purpose of inshore fishing. Is it primarily about catching fish to eat, or is it more to do with supporting traditional communities and culture. As suggested above, a large Vivier crabber (these are boats that have large salt water tanks on board that allow crabs and lobsters to be kept alive) may catch as many tonnes of fish in a matter of days as 100 small fishermen may catch in a year. This is an issue that policymakers need to consider. In the past, European legislation and policy has tended to favour fish extraction as food, rather than supporting local social/cultural infrastructures. Although this issue was not directly considered by the fishers themselves, they were clearly aware of the socio-cultural significance of what they are contributing to Cornwall:

“We're down at Cadgwith and people come down to see a working cove...because there's not very many places like ours left anywhere in the country. Tourism is big business, and they come to places like us...We are creating hundreds of thousands of pounds, just by the way we work” (Helston FG).

The social importance of inshore fishing was also discussed in the *workshop*, in so far that active fishing ports are something that people expect to see in Cornwall, especially tourists.

4.6.2.3 Ecologically sustainable

Because the inshore fishing boats are highly localised and relatively small, the fishers feel that they are *inherently ecologically sustainable*. They are restricted in terms of the distance they can travel from their home port, as well as in terms of the fishing gear they can carry (much of which is static gear). As such, they have a strong motivation to look after their local fishing grounds:

"I mean, we're under 10 m boats, we've got a limited distance, a limit to what we can carry, gear-wise and catch-wise. Why not say catch whatever you want, your impact on the overall fish stocks is going to be minimal... If we ruin our own ground, then we're all out of a job.” (Padstow FG)

The option of allowing smaller boats free reign in terms of what they catch, subject to things like minimum landing size and other technical measures, was endorsed as a possibility in the *workshop*. It was argued that one of the key advantages of taking this approach was that there would be no discards and hence no associated waste of resources: “Let the smaller boats land everything they want, no discards, no danger of choke species; choke species are going to be a catastrophe if things don't change” (WSP 4).

However, this relatively simplistic perspective is not unproblematic. More than once there was discussion about how "you don't get any thanks for being conservation minded" (Padstow FG), not least because there is a danger that the boat concerned will not then develop a track record of catching a particular species, which might subsequently be an issue when quota is allocated. In other words, while an individual boat or boats may choose to preserve their local stocks by only fishing within certain limits, this may disadvantage them in terms of future access to fish. There is also concern that other boats may not be so concerned to preserve local stocks in the long term, effectively freeloading on fish availability in the short term. This point is also discussed under section 4.4.2 and the issue of 'latent quota'.

In terms of ecological impact, it was discussed in the *workshop* that it is not only the size of the boat that is important, it is also the type of gear used: "Some of the small boats have massively powerful engines and are towing a lot of gear, whereas other small boats are hand-lining and arguably have a tiny impact." (WSP 5)

In the focus groups, there was a sense that the growing designation of MPAs would have minimal impact on the smaller, inshore fishing boats. However, discussion in the *workshop* suggested that MPAs will increasingly constrain what even the smallest boats can do. MPAs will soon cover nearly 70% of the Cornwall IFCA district, and are driving a lot of their work; furthermore, Defra continually bring in new targets for the management of MPAs and there is constant pressure from NGOs to classify further areas as MPAs.

"So many MPAs have come in in the last 10 years, and especially in the last 4 or 5 years, and people that fish inshore will find the management measures that are coming in through the MMO and Cornwall IFCA following advice [from Natural England] will in some instances mean that they can't carry on doing what they were doing before. Alongside that there is the issue of displacement, where people will still continue to fish but they're going to do it somewhere else, which may be somewhere they've never been before, putting that fishery under pressure" (WSP 3).

It was also discussed in the *workshop* that more and more bylaws are being drafted that will restrict an increasing amount of fishing activity within MPAs. At the moment these tend to focus on 'bottom tow gear', but increasingly are moving into other areas of management that will definitely affect the inshore sector (WSP 2).

4.6.2.4 The need for re-categorisation

While at one level inshore fishing boats can be categorised as those under 10 m and fishing out of the common pool managed by the MMO, there is clearly an issue with what are known as 'rule beaters'. These are boats that have been specifically designed to be under 10 m in order to benefit from fishing as inshore vessels, and in many cases has involved cutting down larger vessels to 9.9 m in length. While the difference between a 6.5 m and 10 m boat may not sound that significant, it needs to be thought of in terms of the cubic relationship, with the 'rule beater' boats often having very much larger deck spaces and engines which allows them to carry much more gear. The result is that although they may be under 10 m in length, "they've effectively got the capacity of a 15 or 20 m boat" (Padstow FG), negating the benefits outlined above. As such, there was a sense that there needs to be a re-categorisation of what is meant by inshore boats.

The need to more appropriately define what is meant by the inshore fishing sector also proved to be an important debating point within the *workshop*. The definition used within this research has been that the inshore fishing sector includes those boats that are under 10 m in length and fish from the MMO-managed pool. However, the participants at the workshop problematised this definition of what might be included as an inshore boat:

"An under 10 m boat could fish 20 miles offshore... whereas some 15 m boats might exclusively fish within 6 miles (WSP 2)... I think if you asked everyone around the table, they would just define them in terms of the 6 mile limit (WSP 3). Well, there's probably a reason for that, in that through the Marine and Coastal Access Act inshore fisheries became the responsibility of the IFCAs for management and that's probably why people think of it that way" (WSP 2).

"I think we all know what we mean when we talk about small fishermen or small business owners, but we can't define it... It's not a term we really use ... I tend to think in terms of size, really: under 10 fleet and over 10 fleet and also the type of fishing that they do. But not in terms of inshore and outshore" (WSP 1).

"I'd define it as the IFCA – what they manage - the first 6nm, and 6-12nm is the MMO" (WSP 3).

In this respect, it seems that the definition will need to encompass geographical distance, size of boat and type of gear used. To some extent the definition might depend upon what happens with the Brexit negotiations. For example, if the London Convention of 1964 is not repealed, then certain foreign vessels (mainly the Belgians and French in Cornwall) will still have access to the 6-12 nm area. If the Act is repealed, the UK will potentially have exclusive access within the 12 mile limit. There might then be a logic to having this as the defining line.

Participants at the workshop also stressed that the research team needed to be clearer in terms of whether it was referring to: inshore fishing boats; inshore fisheries; or the inshore fishing sector, in that each would elicit a slightly different definition and understanding. In response to this, in keeping with the wider aims of the Sufisa project, the focus in this research is on the 'inshore fishing sector'.

The research team agreed that it would give further consideration to its definition of the inshore fishing sector, but emphasised that the 6 mile limit was important for a number of reasons. This is partly because when pots are put down outside this limit they are in danger of being damaged by trawlers (whether UK-based or foreign); also that the 6 mile limit imposes a geographical focus wherein fishing is relatively localised and constrained, providing a very strong incentive for those involved to look after their immediate fishing environment. In relation to the latter, it also means that those involved in the inshore sector are inextricably embedded within their local environment, both socially and ecologically.

4.6.3 Markets and marketing

Access to markets and the ability to add value to the primary produce emerged from the literature as being of critical importance. It was also something that seemed to delineate between different types of fishers, with some being much more entrepreneurial than others.

Three main issues were discussed in relation to markets and marketing: certification and sustainability; cooperation between fishers; entrepreneurship and adding value.

In addition to these issues, marketing was also discussed in relation to Brexit, particularly in the *workshop*. This was mainly in terms of the uncertainties posed by Brexit, in that approximately 80% of the fish caught in Cornwall is exported. This is most particularly the case with crustacean fishing, which underpins inshore fishing in Cornwall, in that it is almost exclusively exported (live) to markets in France and Spain.

4.6.3.1 Certification and sustainability

The Hand-line Mackerel Fishery in Cornwall received Marine Stewardship Council (MSC) certification at one stage, when there was grant funding available to finance it. However subsequent renewals were considered to be too expensive in the absence of continued grant funding and the certification lapsed. The fishers were also doubtful that it was of any direct benefit to them, in that it is more oriented towards gaining access to supermarkets, which is not something the inshore fishers are doing.

Participants in the *workshop* acknowledged that MSC certification may well appear to be of minimum value to many inshore fishers; nevertheless, while fishermen may not see a direct increase in price:

“What it might have done is provide access to market for the processor – so there is a knock on in terms of the demand from processors that need access to say, Waitrose or M&S...It’s a bit like the red Tractor Mark ... It’s access to markets. So while the fishermen don’t get paid any more, it effectively enables the processors to buy their fish which they might not otherwise do if they didn’t have anyone to sell it to... If you look at the Cornish Sardine Fishery, if you speak to the merchants that process that fish, they have a very large demand for MSC for sardines. If that MSC logo was lost, the accreditation effectively, then I think there would be serious implications for a few of the boats that are ring netting¹² in the Cornwall and Plymouth area. The merchants themselves value it so highly that they basically pay for the MSC because it’s access to markets for them, both in this country and abroad” (WSP 2).

Another scheme potentially of relevance to inshore fishers, is the Responsible Fishing Scheme (described under section 4.3.4.2 of this report); however, there was again scepticism that it is of benefit to them. Rather than certification, there was a sense that:

"If you look after your fish, you get a better price don't you... You don't need responsible fishing laid on the top of it, because those buyers are going to buy it whether you're part of that scheme or not, if it's good stuff. That's right isn't it? Do they pay you any more because you're in that scheme? No, I don't think they do." (Helston FG)

Linked with 'looking after your fish' is the establishment of a reputation for providing quality fish, as well as the development of personal relationships with individual buyers, such as head

¹² A method of fishing for mid water shoaling fish species, especially sardines and occasionally anchovies and herring.

chefs or fish merchants who identify high-quality fish on sale at the markets and then approach the fisher directly. This is recognised as enabling better prices, although it is "very hard to get yourself a good name, but very easy to get yourself a bad name" (Helston FG). In terms of adding value to their catch, developing personal relationships was also acknowledged in the *workshop* as being important. However, there was also an appreciation that the value added achieved through selling to London restaurants may not necessarily be achieved in Cornwall: "A lot of restaurants in Cornwall can't afford to pay those prices" (WSP 3).

The Cornwall Good Seafood Guide, which is being developed by the Cornwall Wildlife Trust (CWT), was discussed in the *workshop* as effectively providing a 'recommendation' of which fish to eat, rather than being a certification as such. The intention of the CWT is to roll the Guide out further and to increase its impact. Over time, it is envisaged that this will have an impact on buying practices and, in turn, the demand for certain types of fish.

A final point in relation to *certification and sustainability*, is the idea that there is a distinction between sustainable fishing and sustainable fish, with the participants at the Helston FG arguing strongly that their mode of fishing is inherently sustainable and that that is what should be promoted at the point-of-sale. Furthermore, that because the catch from inshore boats is usually landed on a daily basis (as opposed to the larger offshore boats which may go out to sea for up to seven days, keeping their catch on ice in the meantime), it has the potential to be the freshest and highest quality fish available:

"People around the room are... catching decent sized fish and landing them daily at the highest possible quality. This is completely different to the big boat fleet... Quite often fish on these big boats that go to sea for a week, it's seven days old before it's landed. Well, in my mind, a fish's life in a cold room is a maximum seven days to start with... It's already past its sell-by date before it's even sold half the time... So because we're maximising the value of the resource, we should be given better regulations, more quota and put at the pinnacle of excellence as far as the fishing industry is concerned". (Helston FG)

The distinction between sustainable fish and sustainable fishing was also discussed in the *workshop*. There was recognition that although the fish species themselves might be sustainable, the practices involved in catching them could be damaging stock or other ecological features. One suggestion was that if fish are highlighted in the Cornwall Good Seafood Guide, then they could be considered as sustainable. The guide considers a variety of factors: the biology of the fish, stock numbers, management regimes, fishing gear used and so on. In this respect, it is perhaps too simplistic to simply label small boats as 'sustainable', in that a range of other factors also need to be considered before making that judgment.

4.6.3.2 Cooperation between fishers

At a community level, fishers know each other very well, have often grown up and gone to school together and would always help each other out in a crisis. However, in relation to their fishing business: "it's one of those businesses that it is sometimes best not to share too much" (Padstow FG). They keep where they have caught fish to themselves; similarly, if they have managed to get a good price for something. In this sense, there is minimum *cooperation between individual fishers* in terms of their business practices. Having said that, there are examples of cooperation in terms of marketing: for example, Dreckly Fish in Newlyn (which is described under section

4.3.1 above) involves a group of three Newlyn-based fishermen selling hake, herring and shellfish directly to six buyers in or near to London (one of the three members was at the Newlyn FG); similarly, Kernow Sashimi, which involves providing processed fish to restaurants in London, buys its fish from a number of local inshore fishermen, endeavouring to pay them 10% more than the average price in local fish markets on any particular day (three of the fishermen who sell to Kernow Sashimi, as well as the owner, were at the Helston FG).

In relation to the lack of cooperation between fishers, one participant at the *workshop* stressed that:

“There’s natural competition between fishers – there has to be – the best fishers know when to be in a particular place, for a particular thing, and if they can beat everyone else to it they’ll make the money ... It’s a resource that everyone else wants... It drives people to get out there” (WSP 2).

4.6.3.3 Entrepreneurship and adding value

In relation to markets and marketing, *adding value* was the most critical issue discussed, inextricably linked with the quality of the fish being sold. In this respect, the catch of inshore fishers was recognised as having the potential to be of the very highest quality available, although this necessitates that the fishers involved look after their fish.

The majority of fin fish landed in Cornwall goes to the harbour markets in Newlyn, Brixham, Plymouth and Looe, whereas the majority of Crustacean and Mollusca go either to processors or abroad via Vivier lorries. The local harbor markets are seen as having an important role to play in providing a baseline price which represents a fair reflection of demand on any one day; yet, more entrepreneurial fishers are clearly intent on adding value to their catch. There was a strong sense amongst those fishers at the focus groups that you have to have a strategy in terms of marketing your fish: "otherwise you are at the mercy of what the buyer is going to give you" (Newlyn FG). In this respect, that a degree of entrepreneurship is critical and it is no longer enough to be simply good at catching fish. This reflects the comment made by Interviewee 9 (see section 4.3 above) that: “a huge amount of fishing economics is around the marketability of the product, rather than the catchability of the species”.

In terms of adding value to a fisher’s catch, it was discussed in the *workshop* that:

“The advent of smart phones is a massive opportunity... We’ve all got access to the internet and couriers and people based in London desperate for sustainable seafood... And yet it still comes down to the fact that it takes a lot of time to build up your own market and there are some fishermen that just want to fish. I think it is a good time to start looking again at cooperatives in Cornwall, but they haven’t been very successful over the years... They depend on people, the right type of people working together (WSP 5)... It’s also a lot of extra work ... fishermen want to go fishing... They like the ability to bring their fish in, drop it off somewhere and the cheque comes through the post a few days later and they can get on with the business of fishing” (WSP 2).

To some extent, the way in which fishers seek to add value has been outlined above; however, it was clear in the focus groups that fishers are wary of openly discussing the extent to which

they are able to add value, as well as where their best markets are. There is an intention to keep this information to themselves, or at least within their own families, in that there is huge competition amongst fishers for obtaining better prices, better markets and so on for their catch.

A number of fishermen sell their produce to restaurants or dealers in London, such as Dreckly Fish or Kernow Sashimi. It is clear that it is possible through taking this approach to get a very considerable mark-up over local market prices, perhaps in the order of 300-400%. Yet, at the same time this requires considerable extra work and know how, which many fishermen are not prepared to do, preferring instead simply to catch fish. In the case of Dreckly Fish, they have effectively created their own market:

"We don't land anything at Newlyn... I come in with my fish in the morning, I speak to my customers [in or near London] and they say I'll have that... and they get it in their shop 20 hours from when we've caught it. And the buyers can't compete with that... Whatever I catch is pictured on twitter, straight to my customers and they take everything we have... Like you said, you've got to be entrepreneur, you can't just catch fish, chuck it on the market. Those days are gone." (Newlyn FG)

Developing Dreckly Fish involved travelling to London to make face-to-face contact with potential customers, as well as continuing to develop those personal relationships (based on trust and continued quality) over time. The local FLAG has also been important in terms of helping to fund the purchase of iphones and ipads, as well as refrigeration equipment to help facilitate the start-up of the business. It has not been an easy process, requiring both commitment and energy to develop these new outlets, as well as a system that ensures that the fish reach the end consumer in the best possible condition:

"I'm not being funny, but a lot of the inshore fishermen are just lazy. They catch the fish, they throw it on the market, they don't get a good price, they moan. Well, do something about it. That's what we have done... Basically you aren't going to have it given to you on a plate; you've got to work for it. Most people can go and catch fish, but it's getting rid of it is the hard part. And the quality side of it... There's no point in catching the bloody stuff, if you're not going to look after it... If you don't look after it, nobody is going to pay for it". (Newlyn FG)

Selling to local restaurants is another market avenue that adds considerable value to the catch. In order to do this, it is important to develop a good relationship with the head chef, to the extent of calling them every day to tell them about the catch that is available. In this respect, Padstow is luckier than most in that there are a number of high-end restaurants and it has become a bit of a foodie hotspot:

"I think several of the boats land to local restaurants. We get quite an inflated price compared to most people around, so tourism is doing its bit for the local fishing industry without a doubt... I think the fishing boats [in turn] do a tremendous amount for this town. It's a big draw. If it was simply to become a marina, I don't think it would have any soul". (Padstow FG)

Community Supported Fishing has been tried in Helston as another way of adding value, following a television programme in 2012. However, it soon failed in that there wasn't the variety of fish available and people really wanted fin fish rather than shellfish. Smaller fishers also struggle in terms of continuity of supply, which is something that most buyers demand:

"The trouble is you haven't got a very long sell-by date with fish... If you hadn't sold it by dinner time you ain't going to sell it the next day. If you come in with a bag of potatoes, they're going to be there for a week, and they ain't going to hurt... And, as a nation, we don't eat a lot of shellfish... People are lazy aren't they, people don't like to sit down and pick crab, whereas on the continent it's a nice thing to sit with Spider Crabs on the table, sit down with a glass of wine, eat and chat. We don't do that in this country do we?... We put three hours into cooking a roast dinner on a Sunday, and 20 minutes into eating it. And I think the Europeans, certainly France and Spain, put 20 minutes into cooking Spider Crab, and they will pick it clean over three hours of conversation and wine, and it's cultural, totally cultural." (Padstow FG)

In other words, in the UK, and even in Cornwall, fish is generally speaking not part of our culinary culture. This echoes what was said in the interviews, and represents a major area where a growth in domestic demand could be encouraged with the right incentives and representation. In this respect, there was discussion in the *workshop* that it is risky for small-scale fishermen to only develop markets outside the region, not least because they may have a problem in ensuring a continuity of supply. As such, there is an opportunity and need to develop more local markets: "If only local people would do more with the local product (WSP 5)... But this requires a complete cultural change" (WSP2).

4.6.4 Quota

In all three focus groups, discussions around quota were the most vibrant and heated; particularly in terms of having access to more quota than is currently available. The discussion focused around three main areas: access to quota; the monetisation of licences and quota; and track record and latent quota capping.

4.6.4.1 Access to quota

Access to sufficient quota that was the single biggest issue discussed in the focus groups, often related to the CFP and the opportunity presented by Brexit. The following quote is from a Newlyn FG fisher who is active in the group 'Fishing for Leave':

"The only reason why we're dumping fish is because the French have got all the quota. You remove the French, then we get our quota back and then we'll give them what we've got left... The whole quota system stinks. It doesn't work... What you've got to remember... When I first started fishing, them boats were up the Channel, with old 60 foot side-winders with a 200 hp engine in it. Now they are up there with 38 m beam trawlers with 3,000 hp in them and fishing under grandfather rights; that's not right. The minute they change the vessel and its form of fishing, they should have been kicked out" (Newlyn FG).

In this respect, there was a strong feeling that there are plenty of fish around and it is just a matter of allocating them more fairly and re-visiting historic 'grandfather rights' and Relative

Stability¹³. There were also concerns that the quota system is not managed properly in terms of determining what an appropriate quota is:

"They haven't any clue what's out there... What we need is for people to work out exactly what fish is on the ground and set the quotas accordingly. At the moment they're probably two or three years behind what's actually happening." (Helston FG)

Likewise, in terms of the "disproportionate allocation between the over 10s and the under 10s", whereby:

"94% of the quota goes to the over 10s and a measly 6% is shared out between the mass of the boats, which by far exceed the number of over 10s. It's a pitifully small amount... That is the crux of the problem. Little small boat men haven't got enough quota... But to get more we've got to take it off the over 10 m. The over 10 m quota is owned personally by the fishermen and the boat owner... So if we have it, it's going to affect them, so obviously they aren't going to give it up. The only way it's going to happen is if the Government was to give the under 10 metres more quota of its own and just leave what's up there to them." (Helford FG)

One suggestion raised in the Helston focus group was that:

"What needs to be done for the inshore fleet, I would have thought, is you need four or six years of fishing without any quota restriction at all and everything logged, so that the Government can see exactly what is being caught, exactly what is there, and then bring in quota system that's appropriate to the size of the fleet" (Helston FG).

The over 10 m sector can buy, swap and own their own quota, whereas the under 10 sector cannot own quota. However, at the Helston FG it was discussed that it would be good if the under 10 sector was able to buy quota that could then be leased back to under 10 m boats, thereby giving them more flexibility in terms of what they can catch. In this respect, quota management for the U 10 m boats might change if there was a dedicated inshore PO, which is being mooted and discussed with Defra (see the section on 'representation of inshore fisheries' for further details). Flexibility in terms of what they catch is critical to the smaller boats:

"Under 10 m boats aren't nomadic, we only catch what swims past our doorstep, when it swims past our doorstep... Give us our quota estimation for the year [rather than each month]. Instead of giving me 135 kilos, give me half a tonne, or a tonne, which is more or less what they reckon I'm going to be allocated for the year. I'll manage it; they won't have to. You can then use it when you want to use it." (Helston FG)

4.6.4.2 The monetisation of licences and quota

Originally, both licences and quota were distributed by the UK Government for nothing, but now you have to buy them and there are brokers who will sell you a licence or quota. The U 10 m boats are unable to own quota, which is allocated to them from the U 10m pool by the MMO, although the monetisation of quota will still have an impact on them if they want to lease quota that is additional to their allocation from the pool:

¹³ It was discussed that in this respect the London Fisheries Convention 1964 will need to be repealed.

"There's no value to a licence, but I can't go to sea without a licence and I've got to buy a licence of about £280 per kilowatt... They were given out originally [with no cost and hence value]. Now all boats have to have them, they aren't creating more of them, and they don't automatically say to a guy when he retires, okay, we're going to wipe your licence out now and give it to a young fisherman, or put it into the pool, so that the young fishermen can take it. There's none of that so people sell their licences. So there is a value to them... and they're getting more and more expensive. You're talking £10,000 plus for a little boat like mine to have a licence, it's ridiculous" (Padstow FG).

In other words, this is making it more difficult for people to get into fishing, by adding an additional cost burden. Similarly in relation to quota which, it was argued in the Helford FG, should not have a value attached to it and instead should be allocated by the Government without cost, as it was originally. Historically, because a fixed amount of quota was allocated it is in effect a finite resource that has subsequently become monetised because it is in short supply. It has been estimated that leasing quota works out at approximately one third of the value of the landed fish, putting additional pressure on fishers' profitability:

"There's a company called the Cold Fishing Company, that have the biggest beam fleet in the North Sea, fishing out of Lowestoft, and when the owner died his son sold off all the beamers and just leases the quota out [becoming what is known as a 'slipper skipper']. Really that quota should be returned back to the pool to be spread out throughout the country to all the active fishing boats... It all goes back to when quotas were first introduced and they were given a value and that's the problem... There's not supposed to be a value to the quota... Like our licences... When you sell your boat, or when you give up, the quota should go back to the Government and they then re-allocate it to other boats." (Helford FG)

The issue of licences and quota accruing value was hotly (almost angrily) discussed in the *workshop* as being 'one of the biggest policy mistakes ever made':

"Allowing the licenses to accrue value. They belong to the UK. They don't belong to fishermen, but they suddenly do now because people traded them for money (WSP 2). It is basically the fishermen themselves who traded them? (WSP 6). Absolutely. But it's a ridiculous situation. It should never have been allowed. It should go back to the government and be reallocated. And they can't seem to retract from that situation (WSP 2). There are a number of fishermen who have bought a lot of quota ... which obviously deprives smaller boats who haven't got that much money (WSP 4)... It has been running for years and people have exchanged quota for loads of money, we can't get out of it" (WSP 5).

Nevertheless, there was also recognition that reversing the monetisation of licenses and quota is a very tricky problem: "They'd have to buy it back and it would cost billions. I can't see the government doing that!" (WSP 4). "Do you continue with a system that's broke? Or do you pay and fix it?" (WSP 2).

4.6.4.3 Track record and latent quota capping

Allocation of quota is to some extent based on track record, meaning that there can be a disincentive to be conservation minded (as alluded to above). In other words, if fishers are overly

selective and mindful in terms of what they catch, they may be penalised for having a lower track record of certain species and subsequently in terms of their allocation of quota. This is particularly relevant in relation to 'latent capacity' (see section 4.2.2.3 of this report), wherein the MMO in March 2016 sent letters out to all under 10 m vessel owners that did not have a history of catching a particular species in a three-year reference period (2010-2013). If their licence allowed them to catch particular species and yet none of these fish were caught during this reference period, then their licenses were capped and they would no longer be able to catch this species. If a licence is capped, then its value is hugely reduced. It effectively devalues the boat as well, in that the license is tied to the boat. It also removes a degree of flexibility, as some of the boats clearly like to focus on one particular stock -- such as lobster -- but keep others in reserve. However, with latent capacity, if they haven't caught sufficient fish within a certain reference period they lose that option altogether. In turn, this threatens their future viability, in that if stocks of the fish they are concentrating on (such as crab or lobster) crash because large boats come in and work within the 6 nm limit, their alternative options are restricted.

"Scrap this under 10 m licence capping... If they can diversify and do three or four different methods of fishing, they are easing the stocks on each of the other things they are not fishing for at that time" (Padstow FG). "License capping is totally wrong... To my mind, any vessel which is under 8 m is not going to kill the fishing industry... It is the most passive form of fishing you can get" (Newlyn FG).

In reality, only one of the fishers at the FGs had been capped. In two other cases, the fishers had appealed and had their capping removed. There was a perception that most of those caught by capping were part-time fishermen. The fish that are taken off the capped license go back into the main pool. This was the subject of a heated discussion on the morning after the Padstow FG in a café frequented by fishers. One fisher felt that it was unfair, the other that if people were not using their quota it should go back into the pool so that its use could be maximised. The first fisher argued that inshore fishers in particular need the flexibility to not necessarily fish for another species until such time that the stocks can recover; the second that: "If you don't use it, you lose it - put it back in the pool and everybody else can get a little bit more".

One of the main negative consequences of license capping, discussed in the *workshop*, was that there is a danger fishers will be more inclined to hit every stock they can so as not to get caught a couple of years down the line with an incomplete track-record. In this respect: "they fear that government policy keeps trapping them and putting them in a less flexible position" (WSP 2).

4.6.5 Policy and management

Policy and management issues were discussed in four key areas: firstly, financial support for inshore fishers; secondly, marine conservation areas; thirdly, bureaucratic scepticism; and fourthly, representation of inshore fishers.

4.6.5.1 Financial support for inshore fishers

The Fisheries Local Action Group (FLAG) in Cornwall distributes funding from the European Maritime and Fisheries Funds for a wide range of initiatives, including: replacing fishing gear in order to make it more selective and sustainable; designing new pots with escape hatches; support for health and safety measures; help with marketing and so on. Furthermore, in the

latest round of funding they have received another £800,000 to support the fishing industry in Cornwall. Under this new programme there are four themes, one of which is around adding value and marketing, such as helping fishermen to sell direct. In this respect, Dreckly Fish has been helped in a number of ways, including through the provision of iPhones and iPads. In general, as an EU Convergent Area, Cornwall has been well supported by European money for a number of years.

Despite the importance of European funding for the development of fishing in Cornwall, it was not raised as being important in the focus groups, except by the fisher who is part of Dreckly Fish. When the issue was raised, it was felt (or at least hoped) that the UK government would similarly support the fishing industry, although no evidence was produced to support this assertion.

4.6.5.2 Marine protected areas

As set out under section 4.2.5 of this report, there is a wide range of marine protected areas within Cornwall, that is being added to all the time. However, there was a feeling that these do not tend to affect the inshore fishers, not least because a high percentage of them do not tow any gear and are often only using static gear; furthermore, that they have been fishing many of the newly designated areas for many years with no adverse effects:

“If these marine conservation areas are designed primarily to stop the substrate from being ripped apart by towed gear, then I think all the inshore people will say that's fine. But I think there should always be the provision that static gear operators can work within them, according to the rules of the land, and their quotas and that sort of thing. Because we've been fishing those areas all this time and we haven't degraded the substrate or degraded the stock.” (Helston FG)

4.6.5.3 Bureaucratic scepticism

There were frequent discussions about how the people running the fishing industry do not fully understand the issues being faced by fishers, and especially the smaller fishers. This was in terms of everyday management, such as in relation to the distribution of quota, but also in terms of how the UK Government might defend the rights of UK fishers in the forthcoming Brexit negotiations. The following quotation illustrates how many of the smaller fishers feel that the bureaucracy is inappropriate to what they are doing:

“In terms of shellfish: we've got Cornwall IFCA and we've got MMO. We have two sets of shellfish data that you are supposed to enter every day. The only thing that's different is the arrangement of the columns on the top: one is the MMO, one is for Cornwall IFCA. They live under the same roof down at Hayle, but they are tribal, they won't speak to each other and if you fail to do one, the other one sends you a warning letter ... The form is not designed by a shellfish expert because a lot of shellfish is stored, you don't land it every day. Some people do, but a lot of people don't, they store it and land it once a week. How are you supposed to fill in the form when it says daily catch, when you don't even know what it is until the end of the week... It's just not designed properly.” (Helston FG)

There were also concerns about different laws governing aspects of the lobster fishery in Cornwall. The first concerned the two different minimum catch sizes for lobster: 87 mm which

is the European size and 90 mm through the IFCA (in other words, 90 mm inside the 6 nm limit and 87 mm outside).

"This creates a problem that cannot be policed properly. It means that the little boats are being persecuted, because the big boats will come in and haul gear alongside you, keep all the lobsters that you're not allowed to legally keep, saying that they caught them outside the 6 nm limit." (Padstow FG)

The second issue concerned the catching of 'berried' lobster: i.e. female lobsters that are carrying eggs:

"All the berried lobsters, the females that I catch, inside six mile, you've got to return them. I haven't got an issue with that, but it needs to be a nationwide ban. Outside six miles you've got super crabbers that catch loads. They aren't breaking the law; the law is an ass, because they can catch lots of buried lobsters and keep them all. One guy said to me, well, why don't you work one string of pots outside the six mile and all the ones you catch inside, land them. I said, because that's not what we do." (Newlyn FG)

There was also a sense that as small inshore boats they are particularly accessible and as such tend to get boarded more than other boats:

"If IFCA come and board you, the people that board you are really nice, they are friendly, they're polite, but you always feel like you've done something wrong when they come around you... Hellish. You know full well you've done your very best to make sure everything's above board, everything's the right size, but you're always worried." (Padstow FG)

Most of the fishers taking part in the focus groups were 50 or older, with a long memory in terms of how things used to be done when they started out in fishing. In this respect, that there is far more bureaucracy now than there ever was, making what they try to do ever more difficult and frustrating.

"The other problem is they never let up. You no sooner get one thing sorted out, and then they come up with something else, and it's coming from all angles. It might be conservationists, it might be Government, it might be this, might be that. Like Paul was saying, when we started fishing it was a free for all, you could do exactly what you wanted; you could go out there for an hour, you could go out there all day. But gradually we've got to fill this, we've got to do that. And the Government listens to all these exterior bodies that are all so-called experts on the particular subject, fishing, and you know, you feel like you're being bombarded don't you." (Helston FG)

To a large extent, discussion in the *workshop* echoed the concerns and frustrations of the fishers themselves, even though a number of those at the workshop were involved in administrating the bureaucratic rules. In this respect, there was a discussion that legislation and bureaucratic necessities need to be better tailored to the needs of smaller boats; notwithstanding that there were also concerns about making rules even more complex than they already are: "It's good to avoid exceptionally complex rules or they end up in the court because things have gotten ridiculously difficult for people to understand" (WSP 2).

The key problem identified in determining the bureaucratic management and legislation of the inshore sector is captured in the following:

“One of the main factors in Cornwall is that it’s such a mixed fishery in terms of things turning up and things being available to fishermen... What fishermen want to be able to do inshore is take advantage of these opportunities and to be versatile; that’s the absolute key to inshore fisheries being successful. And it seems that there’s an absolute load of measures that have been brought out recently - quotas, catch limits and so on - that are completely contrary to the success of inshore fisheries, despite the government saying that they support them (WS 2)... That’s true. A lot of the recent more high profile initiatives have disproportionately targeted the smaller inshore fisheries. As an enforcement officer, they’ve brought us up against the industry... There’s such diversity of fishing types that trying to find one rule that fits everybody is incredibly difficult. Finding a method that doesn’t hurt someone disproportionately is very very difficult, if not impossible. I mean days at sea would be ideal for some people, but it could crucify somebody else. [In this respect], legislation tends to be a blunt instrument” (WSP 1).

4.6.5.4 Representation of inshore fishers

There is clearly concern that the voice of inshore fishers is not being sufficiently heard and that their access to policymakers is restricted. Even though there is nominal representation on the IFCA, other lobbies are felt to have more sway. Key amongst these is anglers, who are often retired people with more time and a perceived agenda of pushing for closures on gill nets and for bass. As outlined in the sub-section above, there is also a sense that the people making the rules do not really understand fishers or fishing and a perception that ‘those at Defra don't seem to be interested in them’.

“The Fisheries Minister shouldn't be a political position. It should be a permanent job and it probably should be occupied by a former fisherman, someone that has got industry-wide respect and you know is going to get you the best deal. This idiot we've got in charge now, we know he's not going to and we know his brother is a very very big bass angler that's constantly pushing him to get bass as a recreational species... [Likewise] our local MP is a big angler and he also has been pushing in the Houses of Parliament to get a ban on commercial fishing for bass... It just feels very stacked against fishing right now.” (Padstow FG)

The Cornish Fish Producers Organisation (CFPO) has 200 members and the potential to be a significant lobby force. Unusually, it also includes 80 inshore fishers as members, mainly from the south coast of Cornwall rather than the north coast. Nevertheless, despite the large number of inshore fishermen who are members, and that the CFPO claim to represent all fishermen, there was a strong perception amongst the focus group attendees that the CFPO is predominantly concerned with the interests of the larger scale fishermen.

“We've got nobody really supporting us. The PO and that, most of us are in a PO, but they're not really interested in small boatmen... [Not least] because so much of the PO subscriptions comes from the over 10 sector to pay the Executors and pay the Officers and Secretary, and a very small amount comes to the under 10s, so we're almost without

representation” (Helston FG). “They should take under 10s into consideration, but they don't at the minute.” (Newlyn FG)

This perception was endorsed in the *workshop*, where it was discussed that the PO exists principally to manage quotas and that they don't do much for the inshore fishing sector.

“I think the big POs are going to look out for their members and I would say it's biased to the interests of the big players and the smaller ones aren't perhaps represented as well as they can be” (WSP 2).

Partly as a response to this feeling of under-representation, one of the focus group attendees was due to visit Defra to attend the inaugural meeting of the committee of a new coastal PO whose remit is to support the interests of the inshore fishing sector across the UK. At the time of writing, this is still a new initiative that has yet to be fully realised. The proposal is that it would work at a British Isles level, but that every sector, like 7E for example, would have its own representative. Quota given to a particular sector is not transferrable, so quota given to sector 7E is not transferable to 7D, for example. This nascent PO is due to build on the work of the New Under Ten Fishermen's Association (NUTFA), which was set up to represent the interests of inshore fishers, but which never really had sufficient resources to achieve its aims. The potential advantages of having a PO dedicated to the needs of the inshore sector are encapsulated in the following:

“I think the idea of the coastal PO would be that the Government would give that PO the chunk of quota that is allocated for whatever it is, 10 or 15 boats, and that PO can manage it and they can push it from month to month... The Government get seven or eight percent for the under 10s from the national quota, and they then allocate it month by month. But if we had our own PO, the Government would say here, PO, this is your quota, you sort it out.” (Helston FG)

Of particular concern to the fishers is representation at the forthcoming Brexit meetings, something that was articulated very strongly in the Helston FG:

“I don't know who is attending those [Brexit] meetings... These big players, like CFPO the other North Eastern POs, they are going to be around the table and we don't have any representation, it's hopeless, we have no salt in the river... The big POs are not going to say, yes, we need to give 30% of the quota to the under 10s, because it'll just mean they'll have less for the over 10s and they are who they're representing, mainly.” (Helston FG)

There were similar concerns expressed in the *workshop*, where this lack of voice or representation in the Brexit negotiation processes was seen as being worrying. Who is representing the smaller fishers? The POs are recognised as representing fishermen in general, as is the Fishing for Leave pressure group, but neither are really focused on the needs of the smaller boats.

4.6.6 Resilience, succession and the future

This section of the focus group discussion is presented as three sections: firstly, the resilience of the Cornwall inshore fishery; secondly, the issue of succession; and thirdly the future of the inshore fishery in Cornwall.

4.6.6.1 Resilience

As mentioned under section 4.6.1 of this report, the innate passion of fishers means that they are likely to be inherently highly resilient and to continue in fishing beyond the time that makes economic sense. In order to do this, they exhibit a range of different adaptive capacities, such as: carrying extra gear and leaving it to lie for an extra day (which means that there is even more gear on the ground that adds to the pressure on particular fisheries); putting more and more pots down (which requires more investment and adds to the pressure on stocks); going further out to sea (which is inherently more risky); fishing single-handed (which reduces the opportunities for new/young fishers to gain experience); adding value and developing their markets (which requires new skills and perhaps additional investment, such as in IT equipment) and so on. There was a sense that the very small boats in particular would like to work less gear, catch less fish and get a better price for the fish that they do catch:

"If we could work a lot less gear and get the same money that would suit me. I think it would suit a lot of people, but everybody's so mistrustful of the authorities that they will try and maximise everything they do, all the time." (Padstow FG)

This is largely in relation to ensuring a track record, just in case something changes and the fishers involved need to catch different species of fish. Nevertheless, despite the increasing pressures, there was a general sense of optimism about the future of inshore fishing in Cornwall, at least for those people who are currently fishing:

"I think that people will get by one way or another... I think we all want to carry on doing what we're doing. I can't see anybody packing up really, everybody will still be here moaning." (Padstow FG)

The participants at the *workshop* also felt that those already in fishing are highly resilient, finding ways to continue doing what they love doing:

"Fishers are resilient and increasingly becoming resilient by becoming part-timers ... going out and getting a second job, to sustain them in the profession that they want to remain in. It's becoming harder and harder to support yourself purely on a fisherman's wage" (WSP 1).

4.6.6.2 Succession

Although there was optimism about those currently fishing, remaining in fishing, people were much less sanguine about the ability of future generations to get into fishing. One of the fishers said: "My boy would love to get in to it, but it's where do you start. They've taken my fish away [through capping his licence], so that's a door slammed in his face right away." (Padstow FG)

In this respect, cost and opportunity were seen as the two main constraints for those wishing to get into fishing.

"It costs £700 before you go aboard a boat. You've got to have fire fighting, you've got to have first aid, you've got to have risk assessment and survival at sea. Each of these courses cost anything up to £200, and you're not officially allowed aboard a boat until you've got

all the certificates. Then you might go aboard a boat and be seasick. It's not really much of an encouragement for the youngsters." (Helston FG)

There is then the cost of the boat itself, which ranges hugely from perhaps £10,000 up to £100,000. One of the Padstow FG fishers had just bought a 6.5 m boat for £38,000, and another had bought a boat just under 10 m for £65,000. On top of that there is probably £40,000 worth of gear, the need for a truck, a fridge and so on. The Padstow FG felt that there were no obvious sources of money for this, apart from a traditional bank loan and there were clearly concerns amongst the fishers as to where the new generation will come from. If a potential fisher does not have a father/uncle/relation to help them get into fishing, where do they get the finance from?

"That is a problem... I'd have thought nowadays the banks would be very wary about lending anybody any money to go fishing... Especially if you didn't have any experience. If you just went in to the bank and said I want to be a fisherman, they are going to laugh at you... You need to start off as crew and work your way up. Then when you've five or 10 years' experience, if you are any good at it, you might want to then invest your money." (Helston FG)

In terms of opportunity, the tendency for inshore fishermen to go single-handed in order to remain viable has reduced the opportunities for potential fishermen to get into the industry, in that far fewer boats now require crew. The one exception in this respect is the fishing harbour of Mevagissey:

"In Mevagissey there is a history of certain families like the Blameys and the Lakemans fishing from Mevagissey. It's a small close-knit community, and the son has taken it on... But over the next decade things are going to start / somebody's got to buy these boats or I don't know what is going to happen [to the inshore fishing fleet]." (Helston FG)

Those at the *workshop* were also concerned about succession as an issue and that although the FLAG has been very supportive in trying to encourage people into the industry, it is inherently a very unsociable job to be doing. "Young people don't want to do it. They want to be out with their friends" (WSP 3).

"The people that are in the game, who have been in it for many years are resilient and will probably see it through to retirement. But when it comes to succession ... the sons of ... they're lacking in some places and I think we are going to see some ports peter out to nothing. In the future, it's hard to see what will attract enough people. It's never going to be making your fortune – it's a lifestyle choice and it's probably not as popular a lifestyle choice as it was" (WSP 2).

There is also the issue of the monetisation of licences (and quota), as discussed under section 4.6.4.2, which adds both additional expense and complication for the would-be fisher:

"When we left school, you could go and buy a boat... The licence didn't have a value, or I don't know if there was a licence... It was just registration... So you bought the boat, so if it was £10,000, that's what you bought. Now if you bought a boat for 10 grand, your licence would be 10 or 15 grand on top of it. Then again on the bigger boats you've got to

buy the quota as well. So usually you've got your boat is a third, licence is a third, and then your fish quota is a third. So if you bought a £30,000 boat, your outlay is nearly £100,000. So the youngster hasn't got a hope in hell." (Helston FG)

4.6.6.3 *The future*

Some of the key issues raised in the Helston FG that would help ensure the future viability of the inshore sector, include:

- Making sure there is enough quota.
- That there is too much inappropriate bureaucracy, which in many cases is designed for much larger boats.
- Ultimately that "we fish in a very sustainable way and we need quota".
- "We are the visual side of fishing as well".
- "Communities are a big thing".
- "You don't know what you've got until you've lost it".

In summary, fishers are not looking for handouts, such as being paid for creating community or for public good services, but what they do want is: "better legislation, less bureaucracy and more quota. They are the three main things" (Helston FG). In other words, there is a strong feeling that the <10s need to have legislation and management that is more specifically tailored to their needs.

The following quotes are helpful in terms of capturing the perspectives of the inshore fishers in terms of what they would like to see in the future. The first is taken from the Helston FG and the second one is paraphrased from the Padstow FG. In the case of the first quote, it becomes critical to define what is meant by an inshore fishing sector and subsequently an inshore fishing boat (see also Section 4.6.2.4). At present it is generally referred to in terms of boats that are included in the under 10 m pool that is managed by the MMO, but this definition perhaps needs to be tightened up (as discussed in the *workshop*), not least due to the 'rule beaters' who may be small in length, but have significant fishing capacity.

"What needs to be done for the inshore fleet, I would have thought, is you need four or six years of fishing without any quota restriction at all and everything logged, so that the Government can see exactly what is being caught, exactly what is there, and then bring in a quota system that's appropriate to the size of the fleet" (Helston FG).

Extending the limit to 20 nm would help space out the demand and help prevent fishers falling over each other because they are effectively squeezed into a 6 nm zone. This would also help the stocks to recuperate more quickly and potentially help ensure their long-term sustainability. This is particularly important for inshore fishers, who are incapable of being so geographically mobile and fishing new grounds.

4.6.7 Understanding inshore fishers' institutional arrangements

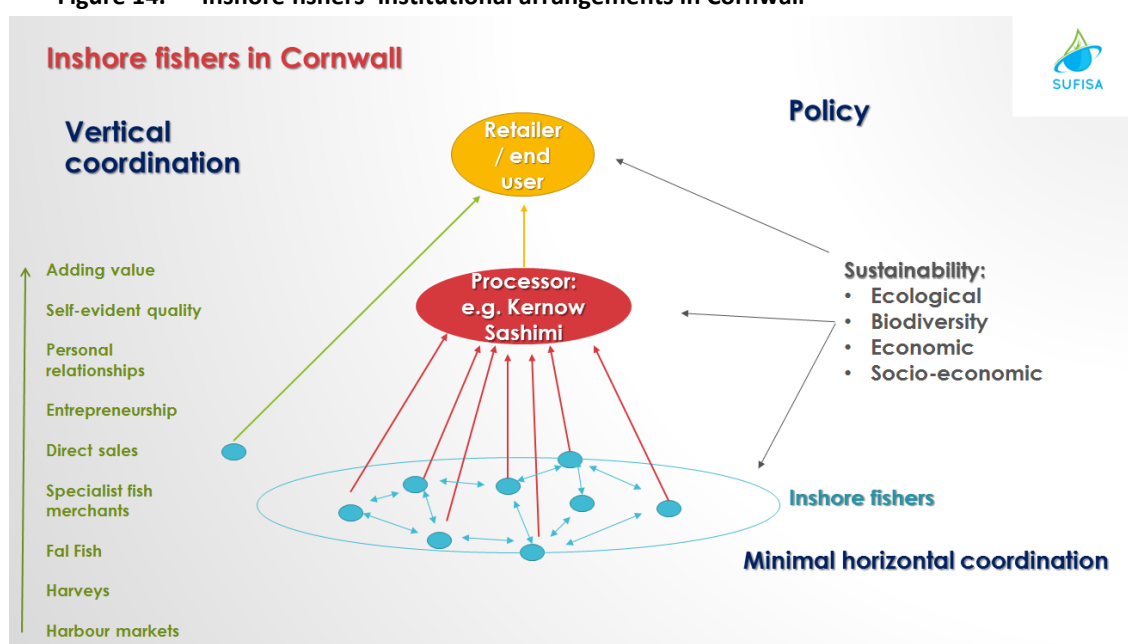
Guiding question		
1. Can you please explain where and how (channels) you commercialize your products?	The majority of fishermen sell their fish through the three fish markets in Cornwall, as well as Brixham in the neighbouring county of Devon. Some fishermen also sell direct to fish processors, restaurants and specialist fishmongers both locally and in London.	Markets and marketing
2. What are the main challenges you have with your customers and the demand for your commodities?	The main criterion that determines the price for the fish being sold, or indeed establishes a demand for it, is its intrinsic quality. Fishers stressed how difficult it is to establish a good reputation for quality, and how easy it is to lose that reputation. For those fishers selling directly through the fish markets, the price they receive is determined by supply and demand on that particular day. For those who have established alternative relationships, the prices they receive are likely to be more consistent.	
3. What marketing strategies do you have in order to secure better deals?	The baseline price is achieved at the four markets mentioned above. Other strategies include establishing relationships with the head chefs of local restaurants, or in London. The advantage of selling direct to London consumers is that in many instances they are prepared to pay higher prices. Other fishers have set up businesses whereby they process the primary fish that they catch, and in so doing add value to it. It is apparent that in order to remain viable in the long term, fishers need to be more entrepreneurial and to find marketing strategies that will allow them to add value to their primary catch. Promoting the intrinsic quality of their fish, which may be less than a day old when sold, is critical to establishing ongoing marketing strategies; similarly, the development of personal relationships.	
4. Is certification part of your strategy?	Certification is not generally seen as important to inshore fishers; rather, they prefer to develop personal relationships and to ensure that the quality of their fish is the very best it can be. Nevertheless, certification may be important for processors, in that they are more likely to sell to supermarkets who usually do require that the fish has certification (such as MSC). In turn this increases demand, which means that certification benefits the prices inshore fishers receive, at least indirectly.	
5. Has there been any recent contextual change that has influenced your current business model?	Nothing significant at present. There may be significant changes once the Brexit negotiations have been concluded, in that 80% of the fish sold through the local markets is exported to Europe. Should significant tariffs be imposed, this might work against the prices received at the local fish markets.	
6. How do you finance your activities, and what would you require to change this?	All of the fishers present at the focus groups were well-established and had no further need to borrow money for their businesses. The issue of finance, or rather lack of it, was seen as being significant in terms of new entrants coming into the industry. The traditional route has been to pass the business down through families, but this is happening less and less. The only mainstream finance available is through banks, which in many cases are only able to loan money against a secure asset such as a house.	Financing

7. Do you work with other fishers? How did this start? How is it going? Will you continue in the future?	Instinctively, fishers are disinclined to work with other fishers. There is a strong sense of independence. Generally speaking, the only interaction between fishers is within families. Having said that, one of the most successful value-added initiatives in Cornwall involves fishers coordinating their activities to some extent - Dreckly Fish - where three fishermen pool their catches together and sell directly to London customers.	Horizontal coordination
8. Do you collaborate with others in the value-chain? How did this evolve? Will you continue with this in the future?	As above, most fishers are disinclined to collaborate with others. Nevertheless, there are instances where this does happen. One of the focus group fishers processed his own catch, as well as that of a number of other local fishermen. Kernow Sashimi is also an example of where a local fisherman, who has set up a processing business, sources fish not only from his own boat, but also from 10 other local fishermen. In so doing, those involved receive slightly higher prices than they would do selling through the local fish markets.	Vertical cooperation
9. Do you feel that the current policy context helps you to improve your business performance?	There was a strong sense amongst the participants at the focus groups that the current policy context works against their interests. This is in terms of too much bureaucracy, but more particularly in terms of their lack of access to sufficient quota. The CFP is frequently blamed, with frustration at the current policy context cited as a key reason why nearly all fishers across the UK voted for Brexit.	Policy and regulations
10. What environmental constraints and social challenges do you need to address?	In terms of environmental constraints there is a growing network of Marine Protected Areas (MPAs), which are increasingly impacting on the ability to catch fish. This is less of an issue for inshore fishers who more often than not use static gear, yet there are concerns that over time as more and more MPAs are introduced, it will start to impact their ability to catch fish. In terms of social challenges, there are concerns that the average age of fishers is rising and that it is increasingly difficult for younger people to get into fishing. The corollary of this is that there will be less and less small boats, impacting on the smaller harbours and coves and reducing their attractiveness to tourists who like to see working fishing boats that involve local fishers.	
11. How do you deal with current policies and regulations? What are your main strategies?	One of the key strategies was to vote for Brexit, in the hope that current policies and regulations can be better targeted towards the needs of the inshore fishing sector. Nevertheless, there is concern that as a sector they are not well represented, and that fishing in general may well be traded away as part of the overall Brexit negotiation process.	
12. What is the impact of your fishing activities on the sustainability of the sector; furthermore, how would you define this impact?	In terms of making a direct contribution to the GDP of Cornwall, or indeed the UK more generally, the inshore fishing sector in purely financial terms is tiny. Having said that, there is widespread recognition that active fishing harbours are known to be a significant attraction to tourists, with tourism contributing 25% of the GDP of Cornwall. Inshore fishing as part of the wider fishing industry within Cornwall is again tiny in terms of its overall turnover, although the more numerous inshore boats are critical to ensuring the attractiveness of many small ports and harbours, as well as the cultural and economic wellbeing of those directly involved.	Financial Sustainability

4.6.8 Understanding inshore fishers' institutional arrangements, diagrammatically

Figure 14 (developed from a generic diagram produced as part of the Sufisa project's first interim report to the EU Commission) depicts the institutional arrangements associated with the inshore fishing sector in Cornwall. The most significant point to note is that there is minimal horizontal coordination between the inshore fishers. Indeed, the findings from the focus groups suggest that in most cases fishers are highly independent, and indeed secretive, both in terms of what they catch, but also where they sell it and for how much. Where coordination does take place, it is likely to be within families. This latter point is of some relevance in that many of the ports include a number of fishers from the same family. For instance, at the Padstow FG one of the participants had a brother, uncle and father involved in fishing, out of a total of 12 inshore boats fishing out of Padstow.

Figure 14. Inshore fishers' institutional arrangements in Cornwall



In terms of vertical coordination, some of the fishers only sell their catch through the harbour markets. A range of different fish merchants then purchase the fish from the harbour markets before selling it on directly to the end user, or processing it and adding value before they do so. It is also clear that a number of fishers have established relationships directly with fish merchants, whereby they achieve a slight price premium over selling direct to the harbour market, or at least greater certainty as to the price they will receive for their catch. One example of this latter case is Kernow Sashimi, who endeavour to source their ingredients from local inshore fishermen, paying a 10% premium over the average prices received at the markets in Newlyn, Plymouth and Brixham, before selling their produce direct to suppliers in London at a better price than could be achieved locally.

Some fishers are also self-evidently increasingly entrepreneurial in their approach to the marketing of their catch, not content to simply receive the going price on any given day at the harbour market. In most cases this is based on developing personal relationships with either head chefs, or alternatively buyers who have a direct link with restaurants. This may be to local restaurants, or increasingly to buyers in London, who are able to pay higher prices for the products involved. Key to ensuring continued access to these outlets is the maintenance of the

very highest quality in the fish being sold, which is highly sought after by top-end fish restaurants. The inshore fishing sector has a considerable advantage in this respect, in that providing the fish are looked after properly, they are likely to be less than a day old when made available to the outlets concerned; something that the larger boats are unable to compete with in that they spend up to a week at a time at sea, icing their catch in the meantime. In making these more direct linkages, there is significant potential for inshore fishers to add value to their catch.

In terms of sustainability, the inshore fishing sector needs to consider four main aspects. Firstly, ecological, in terms of the growth in the number of MPAs and the impact this may have on which areas may be fished, for what species, using which kinds of gear. Secondly, biodiversity: both in ecological terms, but also in relation to the stocks of fish available for the fishers in Cornwall to catch. This is of course closely related to the policy issue of quota. Thirdly, economic: again, the availability of quota is a critical issue, but so too is access to particular fishing grounds by local Cornish fishers as well as fishers from other EU countries. Adding value to their catch is another key issue in relation to the economic viability of inshore fishers, which in part is influenced by the culture of eating fish within the UK, as well as continued access to EU markets. Continued access to EU markets post-Brexit is a major factor, in that up to 80% of the fish caught in Cornwall are exported to the EU – mainly to France and Spain in the case of the inshore sector. Fourthly, the socio-economic importance of inshore fishing to the overall image of Cornwall as a tourist destination is of critical importance, requiring continued policy awareness and support.

It is clear, even from the few paragraphs above, that policy has a critical role to play in the future viability and sustainability of inshore fishing in Cornwall. The Brexit negotiations provide an opportunity for reflecting upon existing policy and endeavouring to make it more appropriate to the needs of the inshore fishing sector in places like Cornwall. In reality, of course, the Brexit negotiation process may mean that significant compromises will need to be made.

4.7 Brexit

4.7.1 The fishers' perspective on Brexit (taken from the focus groups)

Brexit was often mentioned as being pivotal to the future of the inshore fishing sector in Cornwall, as well as the fishing sector more generally.

“This is British fishing's main chance it will ever have. If the Government cock this up we'll never have a chance like it again. And we have got to get away from the EU. We've got to get EU boats out of our waters. We've got to try and take back control of the quota” (Newlyn FG).

Apart from access to more quota, the key issue in relation to Brexit discussed in the focus groups was to try and extend the limit of waters that are exclusive to UK fishermen. At the moment, EU vessels with 'grandfather rights'¹⁴ are able to fish within the 6-12 nm range (in Cornwall this is

¹⁴ Initially this was for shellfish boats under sail targeting crawfish, which is a great delicacy in France. As the boats became motorised, the limit was extended from 3 n miles to 6 n miles to take account of the motorisation. As time has gone on, the boats have become replaced with ever more powerful trawlers.

mainly French and Belgian boats). Originally, this involved relatively low powered boats, but now often involves very modern, technologically-advanced trawlers. Due to the profound changes to the boats since the introduction of 'grandfather rights', many of the participants argued that the whole notion should be revisited, including that the rights should cease once a boat is sold¹⁵.

"First thing we get the French outside the 12 mile limit... Sometimes there's 15 or 16 big trawlers working between the six and the 12 mile limit, scooping up and down, especially if they can get a bit of lee from the north westerly wind. That would make a huge difference" (Helston FG).

The main reason for pushing for this change, especially from an 'inshore boat that lays pots' perspective, is that any pots they lay between 6 and 12 nm are in danger of being towed out by the trawlers (although not explicitly acknowledged in the FGs, there are also UK-based trawlers fishing in this area). Over the years, many of the fishers have lost hundreds, if not thousands, of pounds worth of gear to this process. As a result, in order to try and reduce this risk, many of the fishers have decided not to lay their pots beyond the 6 nm limit. It was argued that extending the limit to 12 nm (or better still, 20 nm) would help space out where the pots are placed, because at present they are effectively squeezed into the 6 nm zone. This should also help the stocks to recuperate more quickly and potentially help ensure their long-term sustainability. This is particularly important for inshore fishers, who are incapable of being so geographically mobile and able to fish new grounds.

"You've got a third or half of your day boat fishing fleet that's more than capable of working between that six and 12 mile limit. Now those French trawlers, you cannot work with them, they will tow your pots. I've probably been towed three times this year... So you think to yourself it's not worth losing gear over it, so you come inside the six mile, so that's then squeezing all the gear in and you're over-crowding inside the six mile. Opening up to the 12 mile and pushing the foreign boats outside into international waters, would free up everybody's fishery here... There's been a lot of talk about getting our EEZ back, but if the 12, or better still 20 miles, was solely for UK boats, it would benefit all of the little boats in towns like Padstow and Port Isaac and Newquay. We could fish outside the six mile and we wouldn't be all on top of each other. All our gear would be more spaced out. We could leave a two-mile box for the UK trawlers, for two months, and then we could shift that box. But we would know our gear is safe" (Padstow FG).

Despite this general sense of optimism that Brexit will result in positive change for the inshore fishing sector, there was also concern expressed at the Helston FG, in particular, about the dangers of the Brexit negotiations, especially in relation to the export markets for fish.

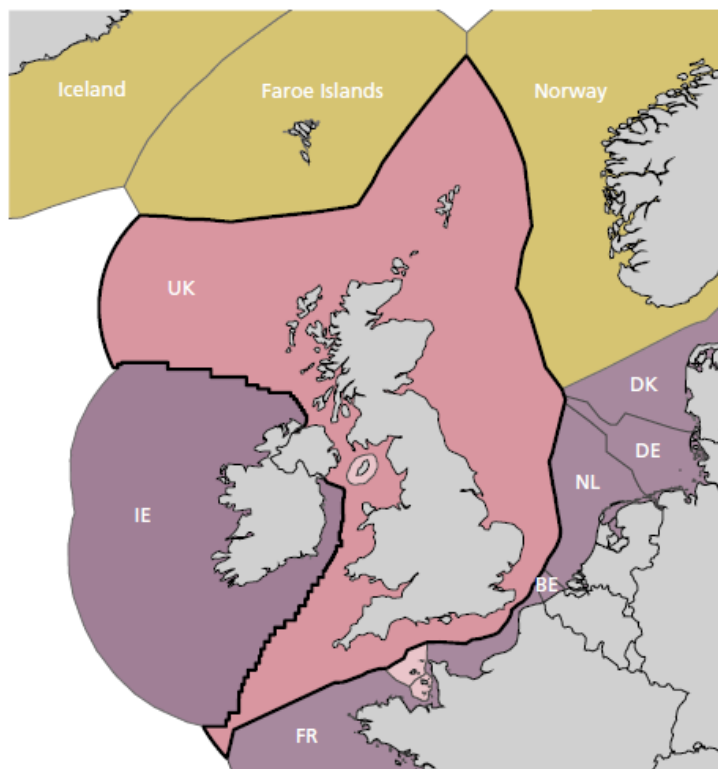
"I think it's unfortunate we had to go through a Brexit vote to control this issue, because this should have been done a long time ago at a national level. I'm sure there must be legislation available for us to have tapped in to, to at least push these foreign vessels out to 12 miles. We didn't need to go to Brexit, because Brexit is going to make a hell of a mess of the marketing. I don't think people realise the implications if the French and Belgians and Dutch suddenly feel they're being pushed aside, especially if they think they

This creates a real problem for local boats working with pots and nets between the 6-12 n mile limit. Over the years, many thousands of pounds worth of fishing gear have been towed away.

¹⁵ This is likely to include repealing the London Fisheries Convention, 1964.

can be pushed out to the Median line. Straight away there will be a ban on imports and everything into EU, to get back to where they started and that will mean most of the fish that's now being caught by the British fleet will be dumped on the home market, prices will collapse, completely, because we can't absorb it" (Helston FG).

Figure 15. Map of the UK EEZ



Source: House of Lords (2016, p. 10)

Similarly during the discussion in the Padstow café with fishermen, where their instinctive enthusiasm for Brexit was tempered by a concern that nothing much will change in reality, not least because they are unconvinced that the UK Government will fight their corner.

"I think that fishermen are resigned to the fact that nothing's going to change [post-Brexit]. The fishing industry was strongly behind it, they've kind of pumped the fishing industry up: we want our waters back! We want our waters back! What's the likelihood that we're going to get them back: probably very, very slim because the French and Belgians do rely on these areas to get a certain amount of fish and their governments fight like hell to get it. And our Government doesn't really seem to give two hoots about the fishing industry, the way theirs do. I think we will be used as a bargaining chip for something else, like farming" (Padstow café).

Brexit was also discussed in terms of being able to more directly influence policy when it is being developed at a Whitehall level, rather than by the Commission in Brussels. Having said that, there were clear concerns as to whether the perspective of the inshore fishing sector is being heard when these issues are being debated. The latter is explored under section 4.6.5.4 on 'representation', but is worth also including under this section on Brexit.

"I feel that our voice is more likely to be heard if we're talking to people in Britain, rather than if we're talking to people in the rest of Europe. At least, if it's our country, there are people we can have meetings with and actually talk to, face-to-face... Whereas dealing through the EU takes months and months or even years, before something could happen" (Helston FG).

"I don't know who is attending those [Brexit] meetings... These big players, like CFPO the other North Eastern POs, they are going to be around the table and we don't have any representation, it's hopeless, we have no salt in the river... Because it is... the over 10s who they're representing, mainly" (Helston FG).

4.7.2 Developing scenarios in the workshop

As set out in the introduction to section 4.6, there were two main aims for the workshop. The first involved 'ground truthing' the research that was conducted as part of task 2.2 (which has been done in the sections above); and the second involved developing a range of scenarios regarding the future viability of the inshore fishing sector in Cornwall, which was inevitably linked to the Brexit negotiations. To start this process, the workshop participants were asked to fill in the following table (Table 4), individually. This was partly to provide the research team with some useful data, but also to get the participants thinking about the issues from the perspective of the organisations that they represented. Full details of the participants' responses are given in appendix 6, with the key issues raised in Table 4 being fed into the text below, as appropriate.

Table 4. Cornwall Inshore Fishery – looking to the future

What are your Priorities in relation to Cornwall's Inshore Fishery over the next five years?	How will these be best Achieved	What will be the key Challenges / Uncertainties in relation to Cornwall's Inshore Fishery, both during the negotiations and after Brexit?
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4.7.2.1 Taking back control of (UK) waters

In response to what are the opportunities and threats posed by Brexit, the response was:

"It depends what is dropped and what we adopt. There's this clear notion that we would adopt the CFP in the short-term and then decide what to keep and what not to keep... But what we definitely see is the EU making broad brush decisions about what's appropriate for a particular sector: the gear it has, the net sizes and so on... It doesn't work in mixed fisheries, which we have down here... So if we can hope for the legislation to be made more appropriate to particular fisherman in particular areas and that this broad brush stuff is abolished" (WSP 2).

Two of the workshop participants, in particular, were adamant that the CFP was not fit for purpose and that Brexit offered the opportunity for change: "We need suitable management through fisheries legislation which we haven't got at the moment" (WSP 2); furthermore, that this included being able to keep foreign boats outside the 12 nm limit (predominantly French and Belgian boats in Cornwall). WSP 2 went on to say that in terms of its negotiation tactics, the

UK should start by demanding that the UK reclaim its 200 mile EEZ, but more realistically aim to end up with the 12 nm limit.

"Ideally take over all our waters out to the middle of the channel via UNCLOS and out to the 200 mile zone. Or at least abandon the London Fisheries Convention so the UK has sole access to the 6-12 nm limit." (WSP 4).

"I am optimistic about the 12 mile limit because there's so much pressure from the industry. I also think that it's one of those things that's tangible to the public: 'look what we've got back – it's our 12 mile limit'. It's not an airy fairy thing, it's a physical asset that people can see and get a grasp of. In my view it would be politically astute to introduce it because the public would see it as a really good thing to have done (WSP 2)."

When asked what would be the impact on the inshore fishing sector in Cornwall should the UK Government fail to get the 12 nm limit imposed, the response was:

"Disastrous really: we've got to get that 6 miles back. There's this huge fleet of French vessels towing between our 6 and 12 mile limit (WSP 4)."

"So from the point of view of the inshore sector it could make the difference between surviving in perpetuity and actually going out of business when this generation of fishers dies off (WSP 6)?" A statement that was greeted with a chorus of 'yes!'.

In this respect, there was a general sense that things are not going to get any worse post-Brexit in relation to the inshore fishing sector, and hopefully will get better.

A key benefit of taking back more control of UK waters, it was argued, is that it will enable better and more place-based marine planning. In this respect, that the ability to develop unilateral governance mechanisms that will better suit the UK's purposes underlies why most fishers voted for Brexit: "you'd have to argue, what's the point in us leaving the EU if we don't?" (WSP 3).

"Marine planning is an ultimate aim, I'd suggest, but it can only exist when you've got control and you can't control things when you're part of Europe because there are too many players. It only takes one objection and the whole thing falls down... You see gear conflict all of the time, because everyone wants to be fishing in the same spot. If there's an understanding that one ground is set aside for that and that, then there's a lot of scope to stop that conflict" (WSP 2).

As an example of this, one of the participants had worked in Australia for the South Australia Fisheries Department in the mid-1990s:

"They've got a prawn fishery there and it's a classic example of the Australian government just being able to manage their waters for their own fishermen... The fishing scientists would get all the data from the boats and go away and work out what could be caught, in what areas... As a result, the fishing was sustainable and this was 20 years ago" (WSP 3).

4.7.2.2 Accurate scientific data

Whatever happens in terms of the negotiations, several of the participants emphasised the importance of having accurate science in terms of fish stocks, otherwise it becomes impossible

to determine whether something is sustainable or not. In part, this discussion was prompted by the suggestion in one of the focus groups (and presented as a slide to the workshop participants), that smaller boats should be allowed to fish without any quota at all:

"I wouldn't necessarily agree that there shouldn't be any quota restrictions... In my view, it's absolutely critical that the science is good and that there needs to be an accurate record of what they are doing, so that you can assess if there are any concerns with the stock ... Without data, you're going at them blind ... Keep the science up and there's a possibility of relaxing quotas I would suggest for some of the very smallest vessels." (MSP 2)

There was recognition that there will still need to be coordination with those countries fishing under the CFP, or there is a danger that there will be overfishing. This will require negotiation between the UK and Europe in terms of what the stocks of a particular species are, as defined by ICES, notwithstanding that the advice they give is invariably watered down by political processes. In this respect, the emphasis is more in terms of ensuring that UK fisheries get "a fair percentage of what fish is in the channel" (WSP 4). Two of the more environmentally-minded participants at the workshop argued that:

"Whether the UK should adhere to the environmental principles that govern the rest: then of course it should, unless there's very good evidence not to (WSP 3)... We have to continue to work with Europe to manage those shared resources, because neither side of the channel want overfishing... But we can't go out and catch more, unless the French and Spanish catch less. Do you really think the French and the Spanish are going to start catching less? No" (WSP 5).

4.7.2.3 Access and quota

There was discussion that there are two separate issues at play in the Brexit negotiations: one is the right to fish within a particular area in the sea; the other is the right to catch a share of the fish available in that area (quota). In other words, fishers may have access to fishing grounds, but they may not have quota to catch the fish once they get there. There are likely to be problems in December 2018 when the new quota negotiations will take place for the following 12 months between the remaining members of the EU in Brussels, and yet the UK will not be subject to the CFP after March 29, 2019. Clearly, the UK cannot be ignored in these discussions, even though they may no longer be part of the CFP, much as Norway has to be part of such discussions.

There was also some discussion about scrapping tradable quota, as reported under section 4.6.4.2, above:

"Would the government have to buy it back if we came out of the CFP? Or will it be written off and all of a sudden the quota is worthless overnight (WSP 5)? Some people have spent millions of pounds buying quota. They'd be quite cross if you took it off them and said it wasn't worth any money (WSP 2). Could the government buy it off them (WSP 8)? That is an option, but an expensive option. But it would stop the rot (WSP 2)."

At the end of the workshop, participants were shown a slide which set out the proposals from a 2017 New Economics Foundation publication entitled: *Who gets to fish? The allocation of fishing opportunities for member states* (p. 6):

"Our proposals for reform vary by Member State, responding to the contexts of each system including any national objectives for fisheries that have been established. Some of our proposals for Member States include:

- a government statement clarifying public ownership of fishing rights;
- a quota reserve for new entrants;
- a peer-to-peer quota swapping system;
- a landing tax differentiated for domestic ports;
- a reallocation of quota using socio-economic and environmental criteria."

These were discussed as being laudable ideas, but that in reality are highly unlikely to happen: "I'm afraid I don't think it will happen. Quota reserved for new entrants -- where are you going to get the quota from?" (WSP 4).

4.7.2.4 Access to EU markets

There was recognition and concern that the EU may impose significant tariffs on UK exports of fish, or perhaps even withhold access to certain markets. This could be devastating, in that between 80-85% of fish caught in Cornwall is sold to Europe. It was also discussed that the demand in France for certain species of fish can only be met by fish caught in UK waters, whether by UK fishermen or French fishermen. It was felt that the French and Spanish will carry on eating fish, in that it is integral to their culture. In this respect, that access to EU markets will be part of the negotiation process, along with access to quota and access to particular fishing areas.

4.7.2.5 Looking to the future

There was clear recognition that any change is going to take time, perhaps as long as 10 years. This is partly because government departments in general, and Defra in particular, have faced considerable cuts over recent years and are short of staff.

"You have to ask yourself, what can be achieved with diminishing resources in two years? To ensure that the wheels don't fall off in two years' time, and to make sure things are not just suddenly up in the air, the Government I believe are trying to do this by the adoption process ... There's got to be a plan about where there are opportunities to do things differently, whether that be with the CFP or with the Marine Strategy Framework Directive, or the Habitats Directive, whichever European directive the Government is looking at... It's an opportunity, a once in a generation opportunity for change and it can't happen overnight and I can't imagine there's the resource for it to happen overnight" (WSP 3).

The following quote usefully sums up the discussion about how the short to medium term future of the inshore fishing sector looks, from the perspective of those at the workshop.

"Looking to the future, we have a transition period which clearly makes sense, not least because we don't have the capacity to move substantially forward over the next two years, other than to 'stop the wheels falling off' (WSP 3)."

“Can you envisage in 5 years’ time that we will have a better managed fisheries system within the UK? And if so, what form might that take – both in general and specifically in relation to the small boats here in Cornwall (WSP 6)?”

“I’m an optimist and I’d say, yes, it can’t be worse than it is at the moment (WSP 2). Nothing is guaranteed, but I hope things are improved, considerably (WSP 4).”

“In what sense (WSP 7)?”

“Quota for the UK boats and access (WSP 4). More appropriate regulation. People that are working in Brussels are certainly not aware of some of the intricacies of inshore fisheries and therefore get caught up in this broad brush approach and that’s a problem and has been for a long, long time (WSP 2).”

“I can’t be as optimistic as them. I think in 5 years’ time things will be in a real mess, but I think in 10 years’ time things may start to look good again (WSP 1). By which time all of our fishermen would have retired (WSP 4). I think there’s going to be so much chaos in the next 5 years. I think the negotiations over quota will be hostile and ongoing for the first few years and we’ll be desperately trying to write our own legislation. We will have copy and pasted it by then, but I think we will be looking to change certain parts, but it won’t have changed fast enough for the industry and they will be unhappy that change has not been delivered. I think in 10 years’ time things will take shape again and markets would have balanced themselves out again. But 5 years’ time, I don’t think it will be a good place (WSP 1).”

“In this 10 year time frame, do you think that the inshore fishing sector in Cornwall will be managed in a more context-specific way (WSP 6)?”

“I hope so and I think it’s entirely possible. If we can have our own legislation, one of the key benefits is obviously that we are going to be able to be more responsive to specific environments and circumstances (WSP 1).”

WSP 2 was the most positive in terms of the outcomes of the Brexit negotiations, most notably in relation to ensuring exclusive access for UK vessels within the 12 nm limit.

“I think one of the reasons why I’m more optimistic about this than anyone else is that even if the negotiations ended up with being exclusive access for UK vessels to the 12 mile limit and nothing else, I’d say that was a major improvement. Even if it was just that and we stuck with the quotas as they are for the time being and we were able to manage what we had within the 12 miles (WSP 2). What might we have to give up in order to get that? What would we be prepared to give up to get that (WSP 6)? I would say we shouldn’t have to give up anything, but we might have to. It might be a case of when we come to do quotas, we might not take such a hard line from our end, if we’ve got that 12 mile.” (WSP 2)

Despite a varying sense of optimism, there was an over-arching concern, also expressed strongly in the focus groups, that the UK government is not sufficiently focused on fishing to get UK fishers the best deal possible. In this respect, that "fishing could well be used as a bargaining chip" (WSP 1).

4.7.2.6 Scenarios

It terms of being able to identify scenarios from the discussion, the idea of transition is central; transition in a temporal sense, but also in terms of what is negotiated. There is an 'ideal' starting position (likely, perhaps to be the UK's EEZ or Median Line), which will be the subject of a hard negotiation, ending up with something that is more or less acceptable (a hoped for 12 nm line), depending on the perspective taken.

"I think the idea of a transition. If you think about it in a temporal sense, you'd probably start with what we've got – a needs must type of thing – but then you have an ideal: 'this is what we want to do', but this will be negotiated, so we probably won't end up with that." (WSP 7)

It is possible, therefore, to suggest three scenarios for the inshore fishing sector in Cornwall. However, before doing so, it is imperative to consider a number of over-arching factors, or caveats. *First*, that currently the voice of the sector is unlikely to be heard by those making the decisions regarding the future of the fishing industry. Developing the nascent Coastal Producer Organisation could be helpful in this regard. *Second*, that the notion / definition of an 'inshore fishing sector' is insufficiently precise. The working definition used in this report is that it encompasses boats that are under 10 m in length and managed by the MMO (see section 4.1.2.1). However, it is clear that this needs to be further refined to incorporate the gear used, engine capacity, deck capacity, fish sought, quantities caught and so on. In this way, the very smallest boats in terms of their capacity may be able to benefit from management that is better suited to their needs. This might, for example, include fishing without quota, providing catch sizes, net sizes, MPA restrictions and so on are adhered to.

Third, it is important in policy terms to be clear as to the purpose of the inshore sector (howsoever the sector is defined). In this respect, is it about catching fish or preserving a way of life; making a meaningful contribution to food and nutrition security, or simply providing a limited supply of a luxury product; or primarily in terms of its socio-economic contribution to rural communities? Having a clearer vision of the future of inshore fishing will help determine how it can best be supported by policy and suitable governance mechanisms. *Fourth*, it is important to consider how best to deal with the monetisation of licences and quota. In both cases, neither of these had any monetary value when they were originally issued, but due to their limited availability both have been increasingly traded between fishers. This has led to a situation where the majority of UK quota is owned by a relatively few companies. One option is for the UK Government to buy-back this quota and to allocate it to fishers as they see fit. Inevitably this would be very expensive, but would allow for a different and more policy-targeted approach to be taken in terms of quota allocation. At present the monetisation of quotas does not directly affect the inshore sector, in that they are not able to own quota, with their quota being allocated from a common pool that is managed by the MMO. However, the monetisation of licences does affect the inshore sector. As with quota, licences did not have a value when originally allocated, but now cost in the region of £280/kw of engine power. This means that a relatively small boat may have an additional cost burden of £10-15,000, that represents a significant barrier to those wishing to get into fishing.

Fifth, the timescale involved for any of the possible scenarios to come to fruition may be as long as 10 years. While it is clear that interim measures will need to be agreed quite quickly in order

to allow fishing in UK waters to continue at all, the more nuanced negotiations will be extremely complex and take time. *Sixth*, the fisheries sector as a whole is very small in terms of its contribution to the overall GDP of the UK, with the inshore sector only contributing a very small percentage of that. Partly as a result of this there are widespread concerns amongst those involved in the inshore fishing sector that it may be used as a bargaining chip in the wider Brexit negotiations and effectively become marginalised. This perception is linked to the concerns about the sector's lack of representation.

Bearing these caveats in mind, the three scenarios were developed as follows:

Scenario 1: Retention of the Status Quo.

Following the Brexit negotiations:

5. access to fishing areas and the allocation of quota will remain broadly in line with the current arrangements under the CFP;
6. access to the EU's markets will remain unchanged and no tariffs will be introduced;
7. management of the UK's fisheries will continue to be through negotiations with EU members in Brussels, rather than at a national or local level;
8. existing EU environmental designations will be incorporated into UK legislation.

Predicted impact on the inshore fishing sector in Cornwall:

5. insufficient quota to allow many of them to survive, economically;
6. often inappropriate and burdensome legislation;
7. insufficient opportunities for successors;
8. the decline of the inshore fishing sector in Cornwall.

Scenario 2: UK regains control of its waters to 12 nm

Following the Brexit negotiations:

5. the London Convention 1964 will be repealed, ending Relative Stability and 'grandfather rights';
6. access to non UK boats will be restricted to beyond 12 nm;
7. more quota is reserved for UK boats, including for inshore boats;
8. the EU imposes tariffs of 5-10% on all fish imports from the UK.

Predicted impact on the inshore fishing sector in Cornwall:

7. able to extend their fishing out to 12 nm with less fear of damage to their gear;
8. reduces the pressure on inshore stocks - especially beneficial to pot fishermen;
9. more quota is available to inshore fishers than at present, reducing the impact of 'choke' species and improving their economic viability;
10. a 5-10% tariff is balanced by the fall in the value of the £ relative to the €;
11. EU market demand continues, but more incentive to develop domestic markets;
12. succession opportunities improve and the decline in inshore fisher numbers is halted.

Scenario 3: UK regains control of its EEZ/median line

Following the Brexit negotiations:

6. the London Convention 1964 will be repealed, ending Relative Stability and 'grandfather rights';
7. the UK will take back control of its 200 nm EEZ, or the median line;
8. UK fishing will be based on the United Nations Convention on the Law of the Sea;
9. the EU imposes tariffs of 30-35% on all fish imports from the UK*;
10. access to EU waters for UK boats is strictly curtailed.

Predicted impact on the inshore fishing sector in Cornwall:

7. marine planning of all UK waters is completely under control of the UK authorities;
 8. legislation can be better tailored to local conditions;
 9. a greater share of the quota allocated goes to the inshore sector, reducing the impact of 'choke' species and improving their economic viability;
 10. EU markets demand for their catch is reduced by 30%, meaning that it is imperative to develop more local markets;
 11. restricted access to EU waters will not affect the inshore sector;
 12. greater opportunities and optimism for the future of the sector, including succession.
- If this were to be the case, then tariffs would be set to WTO levels. These operate on a sliding scale, with processed fish having tariffs in the order of 25% and raw fish being lower than this.

4.7.2.7 Presentation of the project's findings to DEFRA

Although the Sufisa project has been financed by the European commission, and it is to the Commission that the results of the research should be reported, it was felt important to also present the results to the UK's government department responsible for fisheries - Defra (Department for the Environment Food and Rural Affairs) – not least due to the forthcoming Brexit negotiations. Contact was made with Defra and a meeting arranged with the Marine and Fisheries Evidence Department. They were keen to hear the results of the research undertaken as part of Sufisa, particularly in relation to the upcoming Brexit negotiations.

A meeting was arranged for 10th May 2017 at Defra's offices in London. Doctors Kirwan and Maye attended the meeting and presented the research team's findings on the Cornwall Inshore Fishing sector. The aim of the meeting was to: provide a brief context for the work undertaken; to explain the methodology used; to flag up some of the key issues that have emerged from the research undertaken; and to present the range of scenarios that were developed as part of the workshop undertaken under Task 2.3.

Some of the key messages presented by the research team, included:

- The inshore sector is desperate for more quota and there are concerns about the introduction of licence capping.
- There is a need to consider buying out licences and quota that have been increasingly traded over recent years, so that they can then be re-distributed by the state.

- Fishers see Brexit as an opportunity for change, but are sceptical that the UK Government will argue the fisheries' position strongly enough in the Brexit negotiations.
- The research team presented that the feeling from the FGs and workshop was that the UK's starting position in the Brexit negotiations should be to get the EEZ back and to hopefully end up with the 12 nm zone returned to UK control.
- The point was made that the inshore sector was very keen to see national waters extended to 12 nm, whereby no foreign boats would be allowed in those waters. The Defra team asked why 12 nm? The response was that much of the current legislation works to this level; it is also a key area in which inshore fishers would like to fish, but are effectively excluded from due to concerns about their gear being damaged.
- The need to give voice to the inshore fishers, not least because neither Fishing for Leave nor the CFPO do this sufficiently well. Defra was interested to hear that FFL does not necessarily speak for the whole of the fishing sector. In this respect, the research team said that there was support at the local level for the development of a Coastal PO.
- Frustration that much of the regulation developed at the Commission is not necessarily appropriate at a local level, especially in Cornwall where there is such a diverse fishery. In this respect, that 'one size does not fit all' and that there is a need for more appropriate bottom-up regulation that has been developed at a local level.
- Concern about the potential loss of EU markets. Related to this, there is recognition that fishers need to become more entrepreneurial in terms of how they market their catch, and that perhaps there is a need to support this through both policy and monetary support.
- In response to the observation that the inshore fishing sector is highly marginal in economic terms, the research team responded that it was of critical value to the wider economy in Cornwall, especially tourism, as well as to the social fabric of many of the communities involved. In this regard, it was discussed that it would be of value to conduct an SROI (Social Return on Investment) on the inshore fishing sector in Cornwall. This would then provide a clearer idea as to the wider benefits of the inshore sector, expressed in monetary terms.
- It was acknowledged by Defra that it would be critical to review, and perhaps repeal, the London Fisheries Convention, in that this convention enshrines the notion of 'relative stability' and hence historic fishing rights.
- Ultimately, if change along the lines suggested above does not come about to some extent, the research team made the point that the future of the inshore fishing sector in Cornwall does not look bright, especially after the current generation of fishers die out. In this respect, that existing fishers are inherently highly resilient, but that fishing as a vocation/job has much less appeal these days, as well as providing fewer opportunities than it did a generation ago.

5 UK Case Study B: Dairy producers in Somerset

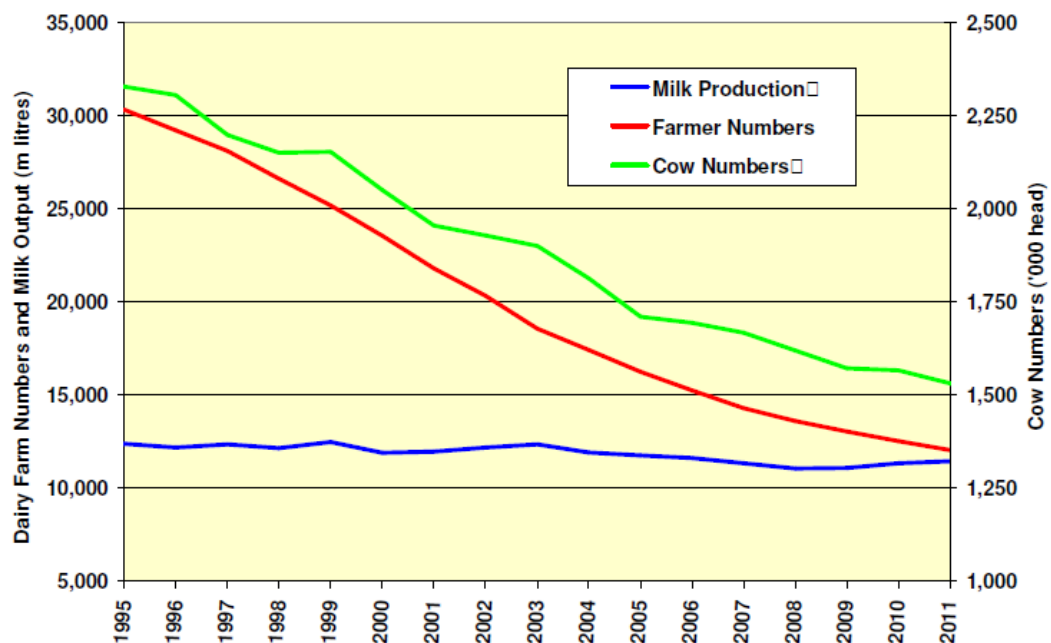
5.1 Case study introduction and context

5.1.1 Dairy farming in the UK

The UK is the third-largest milk producer in the EU after Germany and France, and the tenth-largest producer in the world (Bates 2016). In 2014, the UK recorded its highest production volumes since 1990, with 14.6 billion litres of milk. The dairy sector accounts for about 18% of the UK total agricultural output. England is the main dairy producer, but production is increasing in Wales, Scotland and Northern Ireland (Dairy UK 2013).

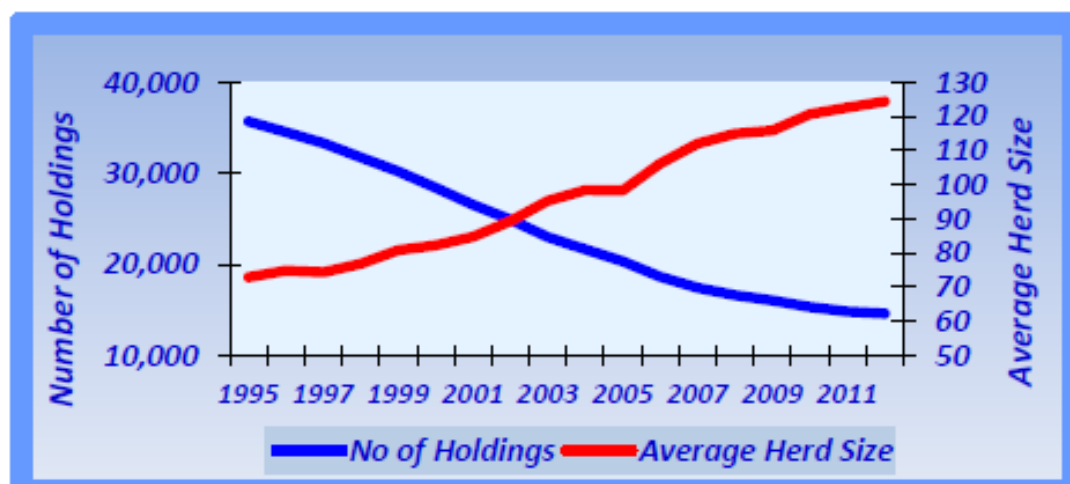
Dairy farming in the UK is undergoing a sustained process of restructuring, characterized by the concentration of milk production in fewer but more intensive farms (Dairy UK 2013). Indeed, in the last ten years the number of dairy farms declined at an average rate of 4% per year, combined with a 27% reduction in the total number of dairy cows (Figure 16). In the same period, the average farm size increased from 75 cows in 1996 to 133 in 2014 (Figure 17) (Bates 2016). As one interviewee noted, “the average [herd size] in the UK is now around 130/140 cows, the highest in Europe” (D: Interviewee 1). This process of concentration into a smaller number of dairy producers was noted by a number of interviewees. The process has been counterbalanced by higher cow productivity. Since 1975, the milk yield per cow increased by 93%, resulting in a 9% increase of total domestic milk production over the period (Bates 2016).

Figure 16. Restructuring of UK dairy sector (milk production, farmers & cow no.s)



Source: Dairy UK (2013)

Figure 17. The number of dairy farms and average herd size in the UK



Source: Dairy UK (2013)

The process of concentration and intensification is reflected further in Figures 18 and 19. Firstly, Figure 18 shows an overall, national trend towards less dairy farms. This accentuated the concentration of dairy farms in the mid-west and western regions of the country (and Yorkshire), which have long been well-known for dairy farming (Ilbery 1992). However, even these established dairying areas have experienced a decrease in the number of total dairy farms. To contextualise these decreases, Figure 19 shows the number of dairy farms as a percentage of the overall number of farms, per county. This is important as the total number of farms is also decreasing. It therefore indicates an overall decrease in the number of dairy farms relative to the total number of farms. In 1995, dairy farms typically represented over 18 per cent of the farms in many of the mid-west and western counties. However, with the exception of Cheshire (where dairy farms still accounted for over 18 per cent in 2013), previously 'strong hold' dairy counties, such as Devon, Somerset and Cornwall, dairy farms accounted for as little as 3-12 per cent in 2013. This is not to say dairy is disappearing. Instead, it reinforces the idea of a trend towards fewer, larger and more productive farms (see Figure 16 above), which has been well-observed throughout developed market economies. In comparison with the EU27 average rate of farm exits, which is about -5%, the exit rate in the UK is lower, at about -3.5% (Dairy UK 2013).

A study commissioned by the Agriculture and Horticulture Development Board (AHDB), which is a stakeholders group of UK farmers, analysed the factors driving structural change in the UK dairy sector (DairyCo 2013). The factors identified can be clustered into two main categories, 'social' and 'economic' drivers, as follows:

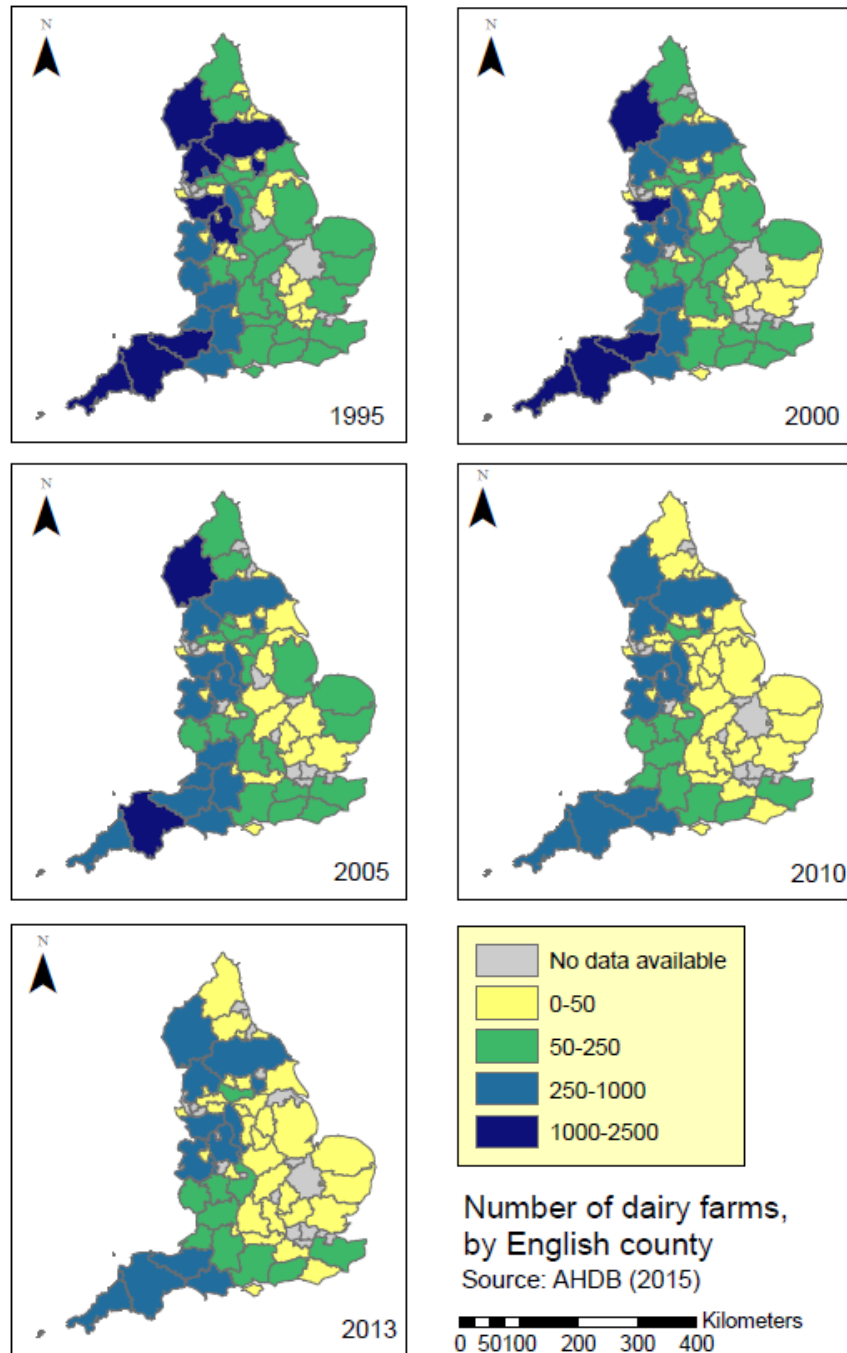
a) Social drivers:

- Succession – the presence of a successor induces farm planning for the future, by increasing productive investments and reducing the probability of exiting the sector.
- Age – younger farmers tend to be more business focussed, seeking expansion and productive innovations rather than exit strategies.
- Education – farmers with higher qualifications are more likely to seek business expansion.

b) Economic drivers:

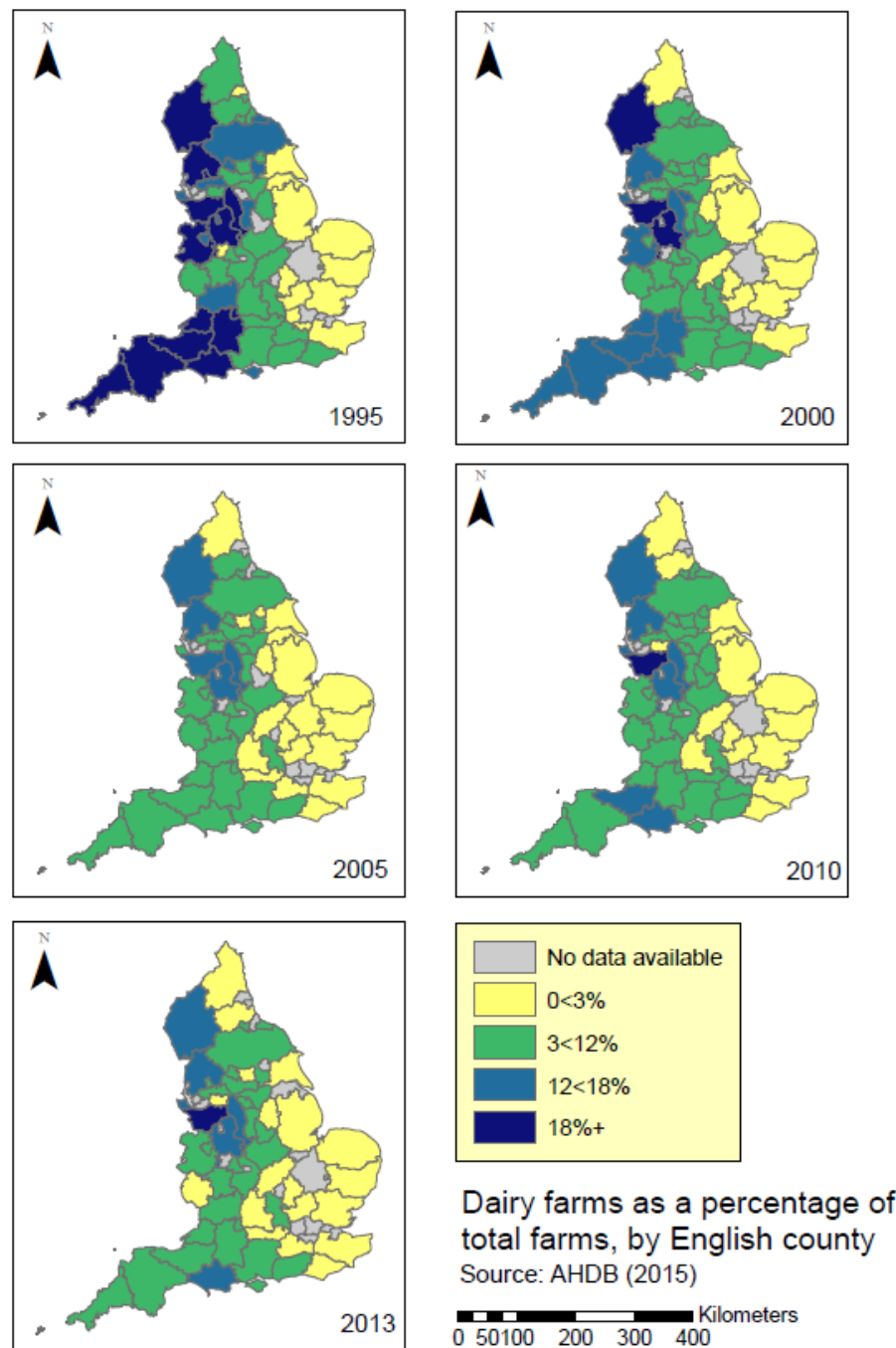
- Profit – the higher the profit, the lower the propensity to exit the sector.
- Cost levels – input prices account for the majority of variation in profit affecting farmers' decisions to exit the sector.
- Milk price – prices can affect business intentions indirectly through profits.
- Family labour – farms with higher levels of family labour are more likely to seek expansion.

Figure 18. Number of dairy farms, by English county



Source: Data - AHDB (2015)

Figure 19. Number of farms as a percentage of total farms, by English county



Source: Data - AHDB (2015)

The DairyCo (2013) study provides a good summary of the key drivers impacting restructuring in dairy and the issues highlighted echo desk review and interview findings reported here, especially in relation to market conditions (see below). These factors can also affect farms in different ways depending on the type of dairy system, which in the UK are variable despite restructuring trends. The types of dairy farm in the UK run from small scale, family, extensive units where animals are exclusively grazed, to more business units where cows are housed and fed for all of their lactation (Dairy UK 2013). The predominant types of dairy farms in UK are:

- Cows at grass: grass-based systems operating at lower yields.
- Composite: use of family labour and a mixed approach to feeding and housing.
- High-output cows: housed for most of the year with intensive use of inputs.

The farmer's choice towards a specific dairy system depends on several factors, including the availability of resources and space, the characteristics of the milk required by the purchaser, the capital available and policy support (Dairy UK 2013). Differences between dairy systems, particularly grass-based and housed systems, were noted in the interviews. Interestingly, interviewees and participants at the first national roundtable argued that rather than comparing systems the key factor is management of the dairy unit (in terms finance, input costs, disease control etc.). As one interviewee pointed out:

“Both ends of the spectrum will be making money, providing it's done in an efficient way. There will be people that are on three times a day milking, feeding everything to their cows, that will make just as much money as a person that's milking their cows once a day on a grass fed system, but they know their business and they have fine-tuned it. They are set up for it and that's the thing...it is knowing that your farm is set up for the right sort of dairy farming and you can do that year in year out, cost effectively” (D: Interviewee 6).

In 2014/2015 dairy farms in the UK had an average Farm Business Income (FBI) of £83,904, which is 4.2% lower than the previous year (McHoul *et al.* 2016). Factors in 2014/2015 that contributed to the farm's income and margins are: CAP subsidy; a reduction in feed costs which helped offset lower milk outputs; good quality conserved forage for the winter period; lower fertiliser and energy costs (McHoul *et al.* 2016). Small dairy farms have a FBI that is 9% higher than the UK average dairy farm, despite the fact that labour costs on small farms are higher than the average and production contracts are less utilised (McHoul *et al.* 2016).

5.1.2 The UK case study area: Somerset

In order to study the conditions, strategies and performances in which dairy farmers operate in the UK, Somerset was selected as a case study area because of its high representativeness in terms of agro-ecological and socio-economic characteristics and dairy farming structure. Somerset is a rural county located in south-west England (Figure 20). Somerset's climate is temperate and generally wetter and milder than the rest of England. The landscape is a combination of hills and large flat levels. The agro-ecological habitat on the hills is calcareous grassland, with some arable land. About 70% of the flat area is grassland and 30% is arable.

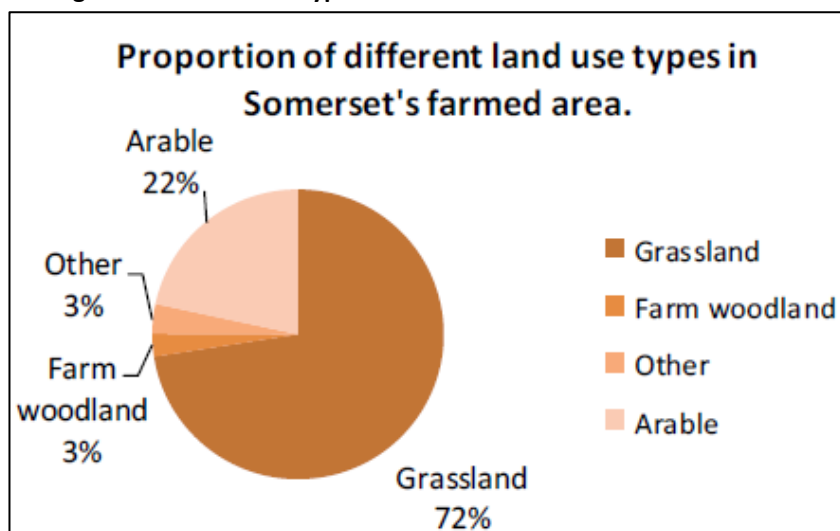
Figure 20. Somerset Location Map



Source: Wikipedia ([http://familypedia.wikia.com/wiki/Chard, Somerset](http://familypedia.wikia.com/wiki/Chard,_Somerset); accessed 21.03.16)

Somerset has a strong tradition of agriculture, especially dairy and livestock farming. Half of Somerset's gross output is constituted by agricultural value added (NFU Somerset). The majority of the area is grassland, with a significant proportion also dedicated to arable crops (Figure 21). The county has heavy soils, which is one reason why there is a concentration of dairy farming (i.e. the land is suited to this form of production). Farms in the county were also small (Ilbery 1992), which further explains the traditional concentration of dairy farms in the county. About 60% of the farmed land is owner occupied (NFU Somerset 2016).

Figure 21. Land use types in Somerset



Source: NFU Somerset (<https://www.nfuonline.com/assets/9494>; accessed 29.09.17)

The total number of agricultural holdings in Somerset in 2007 exceeded 9000 units (Table 5), of which about 30% were small farms lower than 50Ha, and more than 50% were very small farms below 5ha. Dairy farms are quite numerous, accounting for about 12% of Somerset's farms. The number of dairy farms has remained concentrated over time (see Table 5 and Figure 17), although the sector locally has seen some exiting the sector, as noted in interviews. One interviewee usefully summarised the profile of dairy farming in Somerset as follows:

"We've got some real long-term dairy farms here that are family, very traditional...Most of them, virtually every farm in this county, is family run...There are very few, you know, there would be a handful, literally a handful within the county, of farms that are over 1,000 cows, five, four, it's very few...the herds average size in Somerset is probably 200 cows now" (D: Interviewee 1).

In short, herd size numbers in the county have increased but essentially the county retains a profile of mostly family run dairy farms. The county is also home to a number of large processors and high-quality dairy industries, including Dairy Crest, Müller Wiseman Dairies, Wykes, Barbers, the Ilchester Cheese Company and Yeo Valley Organic, which collectively supply domestic food retailers with a wide range of dairy products including yoghurts and cheeses. Among Somerset's traditional dairy products, West Country Farmhouse Cheddar was awarded a Protected Designation of Origin (PDO) designation in 1996 (see section 5.3.6).

In more general terms, Somerset is quite developed from a socio-economic perspective. The unemployment rate is lower than the national average. The most developed sectors are retail,

manufacturing, tourism, and health and social care, which employ the largest part of the population. Agriculture and food and drink production are among the major industries in the county, employing over 12,000 people.

Table 5. Agricultural holdings, farming structure and the dairy sector in Somerset.

Somerset ¹	2000	2003	2005	2007
Total number of holdings	6,030	8,210	8,550	9,410
Number of holdings in LFA	360	510	540	650
Number of holdings <5ha	1,980	4,060	4,220	4,940
Number of holdings with 5-50ha	2,440	2,520	2,680	2,780
Dairy cows, number	109,470	104,570	95,800	91,780
South West ²				
Milk output (Mio £)	590.7	644.2	600.6	647.1
Total Agricultural output	1,699.4	1,889.2	1,938.1	2,0364.4
¹ Source: Eurostat (http://ec.europa.eu/eurostat/web/agriculture/data/database ; accessed 15.04.17)				
² Source: Defra (https://www.gov.uk/agricultural-survey ; 29.09.17)				

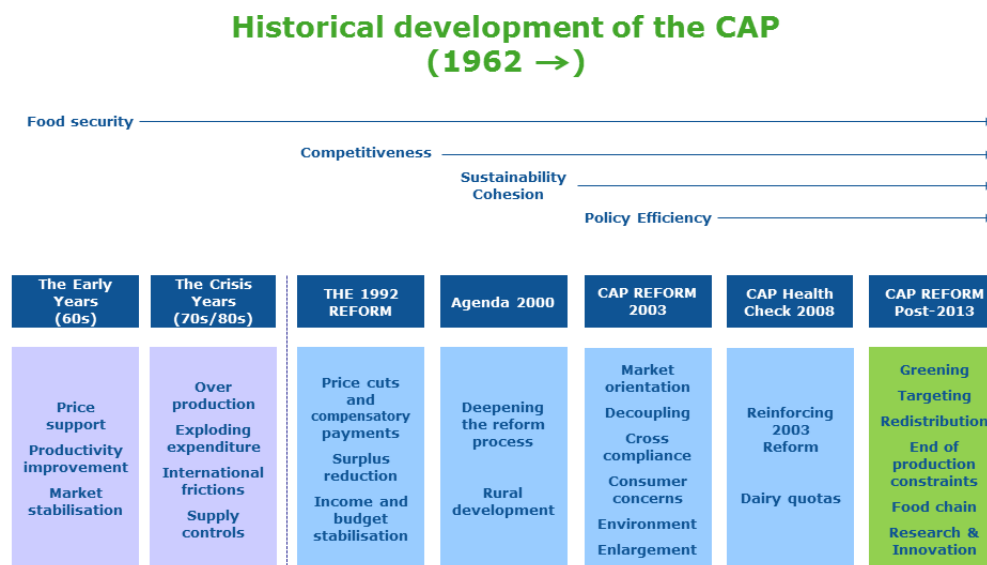
5.2 Regulatory conditions

This section gives an overview of the Common Agricultural Policy (CAP) and related measures which have an impact on the UK dairy sector. It also reviews a broader set of regulations – not only emanating from the CAP- which influences the UK dairy sector.

5.2.1 The CAP and its implications for the UK dairy sector

The CAP sets out the overarching policy conditions for all farmers in the EU. Since its inception in 1962 the CAP has been reformed in 1992, 2003 and 2013. A detailed analysis of those reforms is not warranted here but in essence until 2013 they moved from a product-based support system, focused on preserving food security, to a producer-based support system aiming for greater efficiency (see Figure 22).

Figure 22. Timeline of the development of the CAP



Source: European Commission (http://ec.europa.eu/agriculture/cap-history/index_en.htm; accessed March 2016)

The milestones in the CAP's evolution that have had and are having an influence on the UK dairy sector are (for more details on the first three see Banks and Marsden 1997):

- The introduction of milk quotas in 1983;
- The 1992 CAP Reform and farmers' payments for ecosystem services;
- The abolition of the Milk Marketing Boards in 1994; and
- The abolition of milk quotas in 2015 (see section 5.2.2)

The CAP provides direct financial support to dairy farmers, through its two pillars: the direct support package (Pillar I) and the rural development programme (Pillar II). All CAP payments in the UK are managed by the Rural Payment Agency (RPA). The Single Farm Payment (SFP; now Basic Payment Scheme) accounts for about 30% of FBI, while payments from agri-environmental schemes accounts for about 6% of the FBI (McHoul *et al.*, 2016). A brief summary of CAP payment and related packages is provided below, alongside assessment and comment from interviewees on the role of CAP support.

5.2.1.1 Pillar I support

The 2003 CAP Reform introduced the Single Payment Scheme, based on payments decoupled from production volumes and linked to the number of hectares of land managed by the farm and to cross compliance standards (environmental, food safety and animal welfare practices). From January 2015, the SPS has been replaced by the Basic Payment Scheme (BPS)¹⁶, which is the largest direct support for the farming industry granted by the EU. Only farmers with at least 5 hectares of agricultural land and 5 'entitlements' can apply for the BPS. Applications are once a year - in May - and payments start in December.

In addition to the BPS, farmers can obtain further direct support through, for example:

- *Young farmers' top-ups*: in order to encourage generational renewal, new entrant farmers with less than 40 years can receive additional payments for a period of up to 5 years. This is in addition to other measures for young farmers under Pillar II.
- *Small Farmers Scheme*: farmers can receive an annual payment of €500 to €1250. Participants are not subject to cross-compliance controls and sanctions, and are exempt from greening.
- *Voluntary coupled support*: this is support for struggling sectors due to economic, social and/or environmental reasons. Member states can provide limited amounts of "coupled" payments. This is limited to up to 8% of the national envelope, or up to 13% if the current level of coupled support in a member state is higher than 5%¹⁷.

In addition to BPS support, other support targeted at specific groups of farmers/sectors is theoretically available. BSP is important to dairy farmers and is by far the most significant form of support dairy farmers receive. Interviewees noted that when milk prices are good the reliance on subsidy support is not as significant as some other sectors or for farmers in more deprived regions. However, in the current environment and in other periods of poor milk price the BPS is regarded as a lifeline, particularly for smaller farms and/or farms exposed to global market fluctuations. Interviewees did not always agree with direct support – it was argued, for example, that it helps to keep some dairy farms in business who would otherwise have exited, which was not good for the long-term sustainability of the sector. The following two quotes capture the views expressed regarding basic payment (direct) support:

“At the moment they're [BPSs] sort of a lifesaver in a way, because that keeps you, it'll keep your head above water, whereas two years ago, when prices were good, yes, we had, we actually bought land, 18 months ago, but they, our single farm payment was less than half of one milk cheque at the time and now...I suppose it would be pretty much equivalent to one milk cheque now...it sort of distorts the market as well a bit doesn't it, in a way” (D: Interviewee 3).

“If your farm's not making a profit without that money, it's not sustainable way of farming is it and I think that's the biggest one, a lot of people do rely on their single farm payment to back their business up at the end rather than actually looking at their business and thinking should we invest” (D: Interviewee 6).

¹⁶ [http://europa.eu/rapid/press-release MEMO-13-937 en.htm](http://europa.eu/rapid/press-release_MEMO-13-937_en.htm) accessed on March 2016

¹⁷ <http://europa.eu/rapid/press-release MEMO-13-937 en.htm> accessed on March 2016

5.2.1.2 Rural development programme (Pillar 2)

The 2014-2020 Rural Development Programme for England (RDPE) consists of four main elements: 1) Countryside Stewardship; 2) Countryside Productivity; 3) the Growth Programme; and 4) LEADER. Under the RDPE, £3.5 billion will be invested in rural development until 2020, with £2.1 billion on existing environmental schemes and £900 million on Countryside Stewardship. Countryside Stewardship provides financial incentives for land managers to look after the environment. In 2013, 65% of dairy farmland in England had been entered into Countryside Stewardship agreements (DairyRoadmap 2013). Farmers can also apply for support to convert conventional to organic production or to maintain organic production.

The Countryside Productivity Scheme supports investments in resource management, including, for example, aid of up to 40% of the total eligible costs for machineries improving the efficiency of slurry application and reducing nitrogen loss, aid for the installation of LED lighting in livestock housing for non-intensive dairy farms and improving water management for farmers or groups of farmers. The Growth Programme¹⁸, on the other hand, addresses dairy producers who wish to diversify into non-agricultural activities. The RPA manages the grants, working with Local Enterprise Partnerships (LEPs), financing: business development; farm diversification into non-agricultural activities; micro, small and medium-sized dairy processing; and small-scale tourism infrastructure. Similar to the Growth Programme, the RDPE's LEADER programme aims to provide funding for businesses and organisations seeking developments in rural areas through *ad hoc* projects, which can include support dairy farms if the proposal fits at least one of six priority areas.¹⁹ One interviewee, who runs a LEADER Local Action Group, explained the key difference between the last two mentioned forms of support as follows:

“[T]here's a lot of similarities between the two but the theoretical difference is LEADER is supposed to be bottom-up, so it's supposed to be what communities and what local people need, and we will deliver that, and then you've got the Growth Fund which is much more DEFRA top-down, which is a national programme”.

Interviews noted that uptake of Pillar 2 schemes was minimal on dairy farms in Somerset, particularly since the latest round of agri-environmental supports was introduced, which are much more prescriptive and off-putting to farmers because Pillar 2 payment penalties also impact Pillar 1 payments. The following interviewee summarises the situation well:

“ELS payment in the new countryside stewardship measure is [...] more prescriptive, it's a lot more record keeping and the payments are worth a lot less, so to access the same sort of levels of payment, you would have to seriously compromise your farming system [...] it's more legislative, it's less money, let's not bother, and the fact that you're open up to inspections, which affect both Pillar 1 and Pillar 2 payments, so if you breach your ELS agreement, and get a 3% penalty, that reflects on your basic payment” (D: Interviewee 4).

¹⁸ [Growth Programme: grants for the rural economy](#)

¹⁹ These priorities aim to: 1) support micro and small businesses and farm diversification; 2) enhance and support rural tourism; 3) increase farm productivity (e.g. projects are supported that develop low carbon approaches to improve agricultural efficiency); 4) increase forestry productivity; 5) provide rural services; and 6) provide cultural and heritage activities.

Accessing funds via LEADER was also difficult and the application process onerous and off putting. This was acknowledged also by the manager of a Local Action Group, who explained the application process:

“Well, the first thing is there's an outline application which is basically a basic checking process, so are you in an eligible area, because it's very very tightly defined geographically...They then do a full application which is a horrible, horrible form and it's designed by a policymaker in Westminster without any realisation of what actually happens on the ground...Then it gets externally appraised by an external appraiser...That appraisal is then checked by the RPA and that's where the RPA are now coming in and making all sorts of completely unjustified requests... It then goes to the LAG group for their final decision and if the LAG group say, yes, then actually then it goes through” (D: Interviewee 7).

5.2.2 Abolition of the milk quota system

Milk quotas were abolished in March 2015. Quotas were originally introduced in 1983 for 5 years (Banks and Marsden 1997). The decision to remove milk quotas had been resisted several times but in 2008 it was finally agreed that the quota system would be abolished, through a progressive 1% annual increase of quotas from 2009 to 2013, towards complete removal in 2015. The decision to remove milk quotas was motivated by the increase in demand for dairy products globally, especially in emerging countries like China. The quota regime was viewed as a potential barrier to EU producers responding to this growing global demand, hence limiting the EU dairy sector's competitiveness and growth.

Along with opportunities for expansion and intensification of production, inevitably the abolition of quota also created production and marketing issues that dairy farmers had to face. In the UK, the Milk Quota Scheme was administered by the RPA. Producers exceeding their own quota were subject to a levy based on the volume of milk produced in excess. There were two types of quota: for milk sold wholesale and for milk sold via direct sale. Wholesale quota covered whole milk which was sold in bulk by a producer to a first purchaser. Direct sales quota covered milk and milk products sold directly by the producer to consumers. Ending the milk quota system implied that production should be based on market demand and opportunities, with the dairy industry self-adjusting the quantity of milk produced by monitoring and responding to market signals. In practice, for milk producers the end of milk quotas can: firstly, lead to administrative simplification by reducing the on-farm daily monitoring of milk production levels; and secondly, can increase the need for close and regular monitoring of market signals so that production matches demand (DairyCo 2013). As a result, the removal of quota can be either a business opportunity or a risk factor.

The removal of milk quota is therefore a significant change to regulatory conditions and in the worst case scenario it can lead to more dairy farms exiting the sector. Abolishing milk quotas has several implications, but in general terms they can be classified into two main effects:

- **Production effect:** Predicting the changes in milk production due to the lifting of quotas is not straightforward. In theory, removing the quota should result in an increase in output and, consequently, in a decrease of milk prices. Lower prices can potentially

increase consumer demand, but in the absence of new markets for the additional milk produced, the market is likely to settle at a lower price level (Kovács 2014). The global milk market is an open system influenced by several conditions which make this theoretical equation somewhat invalid. For instance, milk buyers' behavior is uncertain and any changes in their behavior will be (partially) transferred to dairy farmers, influencing the amount of output. In this case, the use of production contracts, which can stabilize prices and market access, will largely affect future dairy production levels. However, the introduction of greater market orientation can provoke a shift towards more competitive value-added products, especially for export. For instance, EU cheese production from 2003 to 2013 increased by 26% and the volume of cheese exports rose by 69%.

- **Price effect:** The dairy market is not a single commodity market, but it is composed of several types of products, with different levels of processing (liquid milk, cream, powdered milk, butter, fresh cheese, mature cheese, etc.). This implies that each product can suffer from specific price effects. By removing milk quota, dairy supplies are no longer constrained, and production volumes can largely vary, exposing farmers to higher milk price volatility. Moreover, higher production volumes combined with unchanged demand levels can provoke prices to drop. If domestic production levels in the UK remain stable, the most significant price changes will come from international markets, that is, from the EU and/or the global market. The greatest price effects will therefore concern tradable commodity milk products, as their prices follow international markets. Overall, how farmers will be affected by the price effect of quota removal will depend on the product they supply, the supply chain and their ability to adapt to market price changes. Dairy producers who will be able to respond to market variations are less likely to exit the sector.

Interviewee responses, when asked about milk quota and its potential impact on UK dairy farmers, were interesting. At one level, interviewees argued the abolition of milk quota was not really an issue for UK dairy farmers because reaching quota has not been an issue for several years due to significant restructuring and downsizing in terms of dairy farm numbers. In other words, the UK has not been close to meeting its quota limit and is therefore not important. However, as interviewees also pointed out, the removal of quota impacts the wider milk pool, particularly at a European level, as noted in the following quote, for example:

“[Quotas have] not been relevant to this country for a long time because we fell below our milk quota a long time ago. It had an effect on other European countries, who have been constrained by quotas. You've seen this huge surge in production in some countries, Germany, Ireland, Denmark, Netherlands, for other reasons, so that's depressed the global market place and the reason why there hasn't been a price response is because, having made this investment, farmers are clinging on and eventually there will be a new equilibrium and we'll go through the price cycle again, so UK farmers have been impacted by abolition through the general depression of the market place, but not directly.”

The impact of milk quota on UK dairy farmers has thus so far been indirect. Symbolically the removal of quota also signals a further step towards complete deregulation of milk markets. There was debate and disagreement among interviewees about whether the milk market is

better under a free market system or a regime of control, with some referring back although not necessarily proposing a renewal of a Milk Marketing Board-type model. For example:

“I think perhaps agriculture sometimes needs protection...that's why we had Marketing Boards and they actually, sometimes it seems a bit immoral, but putting a bottom on the market was very helpful for farmers. Perhaps we've still got that but it depends if we want to keep family farming as a viable business, then it will have to be supported more than it is and, at the moment, the level of support through basic payment isn't enough if commodity prices are this low...it's something that we, as a nation, we've decided, and Europe as a whole has decided, that we go free market, but we're suffering because of it” (D: Interviewee 9).

“I think we threw the baby out with the bath water. I think the quotas were brought in to cure the butter mountains and the wine lakes and stuff. It did that. Rather than just throwing it out, and saying it's crap, people tend to do that, they say, ‘oh, this has got a fault in it, so we'll chuck it out’, but if they've looked at the system and said can we improve it, rather than binning it” (D: Interviewee 3).

Interviewees (D2, D4, D5, D10, D11) noted too that milk quota in the past was an asset, including for tenant farmers, which now no longer exists.

5.2.3 The Milk Package

Published in March 2012, the “Milk Package” consists of a series of measures and policy instruments devised to better support the participation of dairy producers in the milk supply chain, in response to the 2009 milk market crisis. It was also designed to help ensure the long-term future and sustainability of the dairy sector following the abolition of the dairy quota system. The milk package measures have been applicable since 3 October 2012 and apply until mid-2020. The measures constitute a major amendment to the Common Organisation of the Markets in Agricultural Products (Regulation (EU) No 1308/2013 of the European Parliament and of the Council) in which the milk sector is integrated (http://ec.europa.eu/agriculture/milk/policy-instruments/index_en.htm; accessed: 03.05.2016). The rules of the package are concerned with: 1) written contracts between milk producers and processors; 2) the possibility to negotiate contract terms collectively via producer organisations; 3) new rules to regulate the supply of PDO/PGI cheeses; and 4) specific rules for inter-branch organisations. The overall aim of the package is therefore to enhance information availability and the transparency of the market. According to the Milk Package, written contracts between dairy producers and processors can be made compulsory at member state level, and dairy purchasers are obliged to offer minimum contract durations to farmers. The contracts should be made in advance of delivery and must set specificities such as price, volume, duration, payments, collection and rules for *force majeure*. Contracts are expected to be negotiated and farmers may refuse offers of minimum contract duration.

An important aspect of the package is the possibility for farmers to collectively negotiate contracts. With the abolition of milk marketing boards, the role of producer organisations (PO) has increased. As well as the potential to negotiate milk prices, the “volume of milk that a PO can negotiate is limited to 3.5% of the EU production and to 33% of the national production of the Member States involved”. For member states with a production of less than 500,000 tonnes

the limit is set at 45% of national production instead of 33%. This is expected to balance the bargaining power of milk producers across the EU. The other important aspect is that the “limits allow negotiations between POs of approximately the same size as a major dairy processor while maintaining effective competition on the dairy market” (EU commission 2014). Upon request of either a PO, an interbranch organisation or a PDO/PGI group, member states can devise rules to regulate the supply of PDO/PGI cheeses. As noted, “[t]his measure is aimed at ensuring the value added and quality of cheeses with a protected designation of origin (PDO) or protected geographical indications (PGI), which are particularly important for vulnerable rural regions” (EU commission 2014). Specific EU rules for inter-branch organisations allow actors of the dairy supply chain to develop dialogue and to carry out joint activities such as “promotion, research, innovation and quality improvement, for a better knowledge and transparency of production and the market” (EU commission 2014).

The Milk Package, particularly the possibility to create POs, was discussed with interviewees. Stakeholders recognised and were supportive of the overall intentions of the Milk Package and noted the potential to establish POs and to give dairy farmers greater power in terms of negotiating contracts. However, there is limited uptake of this activity in the UK. The reason is partly because of a general culture of non-co-operation among farmers but the scheme is also rather cumbersome as currently implemented by Defra. There is one PO which has set up called Dairy Crest Direct, which has recently split into two POs, one retaining the original name and another linked to supply milk for Davidstow cheddar. The following two quotes nicely capture the views expressed regarding the package and especially POs:

“Dairy Crest Direct, or PO, we were one of the few / only ones pretty much that used the money from the dairy package to help set up the PO's to invest in the futures trading... the main thing about the PO for us was negotiating prices and now volumes...we had to register to be a PO to be able to do that without being in breach of competition law” (D: Interviewee 3).

“The trouble is to create a producer organisation you still have to get together, find a leader, get organised, whatever, a very long protracted process...fundamentally it can't alter the milk price because the milk purchaser has to be sure that they get the competitive milk price, otherwise they go out of business. The Commission came up with this package of measures, look, we've given you the tools to improve your negotiating positions, go out there and exploit them...They're not really relevant to improving their milk price and it doesn't really mitigate the impact of price volatility, so the package of measures is really a bit neither here nor there” (D: Interviewee 12).

5.2.4 Exceptional EU support schemes exclusive to dairy farmers

In addition to the financial aids of the CAP outlined above, there are EU support schemes that have been set up exclusively for dairy farmers. The need for additional aid and support is motivated by and responding to recent market risks and price volatility that dairy producers are facing. For example, through the **Private Storage Aid scheme**, dairy producers could receive aid to store production excess when markets are unfavourable (i.e. when prices are very low). Funding depends on the cost of storage, the quality depreciation and market price changes. Products such as butter, cheese and skimmed milk powder can be stored under the scheme. In summary, the scheme is a form of intervention that subsidises private processors and co-ops to take product off the market. As one interviewee put it,

“It is the European Union intervening in a market and taking product off the market...it hasn't been used for such a long time, its only really come back in the last 12 months” (D: Interviewee 1).

In October 2015 the European Commission also announced a **€500 million aid package** for EU farmers intended as an urgent response to the situation facing the dairy and pigmeat markets. The support package provided flexibility in terms of how member states want to use the €420 million targeted aid to benefit farmers²⁰. In December 2015, the UK dairy farmers received “a one-off support payment linked to milk production to help with their cash-flow problems caused by volatile prices”²¹. In England, dairy farmers were meant to be sharing £15.5m “in recognition of the prolonged period of low prices in this particular farming sector” (ibid). The Farming Minister for the Department for Environment, Food and Rural Affairs (DEFRA), George Eustice, commented that “[d]airy farmers are a vital part of our £100billion food and farming industry and I’m pleased to confirm that ministers across the Union have agreed to distribute the aid in the simplest way – linked to milk production - to ensure the RPA can get this money into farmers’ bank accounts promptly.” In England and Wales, the payment for an average-sized dairy farm was about £1,800.

Following the aid package, in April 2016, the European Commission published new rules providing the opportunity for farmers to jointly plan milk production. This option is provided in the context of **Article 222** of the CAP Market Regulation (1308/2014), which was introduced for the first time in the 2013 CAP Reform. Article 222 allows for special measures to be activated when there is severe imbalance in the market. Specifically, the Commissioner granted member states authorisation to curtail production for an initial period of six months and up to one year. The European Commission allows member states (with the coordination of cooperatives and Producers Organisations) to pay farmers up to €15,000 (£12,000) each as an incentive to “freeze production” in a bid to address oversupply in the dairy market. This quote nicely summarises the rationale behind Article 222:

“It's on the same lines as allowing farmers to take up producer organisations. Article 222 measures said, okay, what we'll do is basically give a further derogation from competition law to allow producer organisations and coops to, which is academic here because it doesn't work in this country, but to come together and basically agree on managing milk supply. In theory, we are in a situation now where the Commission has given the legal basis that all the coops in the European Union come together and say, okay, there's too much milk on the market, we'll all agree to cut production, limit production by X, Y and Z. So it's a derogation from competition” (D: Interviewee 12).

As interviewees explained, the UK and UK POs have no plans to take advantage of Article 222, but other countries (e.g. France) are in favour of market stabilisation measures, including restrictions on the amount of milk produced. Even though the UK has not applied directly for Article 222 support, there are indirect impacts via the common market and global milk markets.

²⁰ http://ec.europa.eu/agriculture/newsroom/231_en.htm accessed on March 2016

²¹ <https://www.gov.uk/government/news/eu-farming-support-package-allocations-announced> accessed on March 2016

The application of voluntary temporary “dairy quotas” by other member states can indirectly affect UK dairy producers’ price conditions, for example²².

5.2.5 Regulations

The following sub-section covers regulations and legislation that are of significant importance to dairy farmers, including the Animal Welfare Act 2006, animal health regulations, especially in relation to bovine Tuberculosis (bTB), and nitrogen reduction measures within the Water Framework and Nitrates Directives. The regulations were identified via the desk analysis but their importance was confirmed and given high priority (bTB, for example) in the interviews.

5.2.5.1 Animal welfare

The main piece of legislation ruling animal welfare in the UK is the Animal Welfare Act 2006. The act states that any unnecessary suffering caused to any animal constitutes an offence. Moreover, people owning animals have the responsibility to make sure that their needs are met. The legislation is founded on the ‘five freedoms’ of the Farm Animal Welfare Council (FAWC). Animal welfare includes: 1) a suitable environment; 2) a suitable diet; 3) the ability to exhibit normal behaviour patterns; 4) any need it has to be housed with, or apart from, other animals; and 5) protection from pain, suffering, injury and disease. According to the legislation, loose yards should not be overcrowded. For average cows of 600 kilograms, a bedded area of 6.5 square meters (m²) and a loafing area of 2.5m² per animal, with water troughs sited in the bedded area, should be provided. Cleanliness of animals is important in decreasing the likelihood of disease and milk contamination with bacteria or other micro-organisms. Animals with infectious diseases should be isolated appropriately. In addition to the Animal Welfare Act 2006, DEFRA provides a Code of Recommendations for the welfare of cattle²³. The code is not mandatory, but farmers are legally obliged to make sure that all staff attending cattle have access to the welfare code, and the welfare codes effectively sit below the welfare act. Interviews recognised the importance of regulating animal welfare. Animal welfare issues are mostly governed through standards, with the Red Tractor guidelines providing a benchmark/basic standard. As one interviewee from Dairy UK remarked,

“I think [animal welfare] shows a relative degree of stability because I think the industry has demonstrated the same credentials to the Red Tractor Scheme” (D: Interviewee 12).

5.2.5.2 Animal health, especially in relation to bTB

In terms of animal health, diseases and related regulations fall into two main categories: ‘notifiable diseases’ and ‘non-notifiable diseases’. For notifiable diseases a list of 13 or so cattle diseases exists at present and are classified into ‘endemic’ (i.e. diseases already present in the UK, such as bTB) and ‘exotic’ (i.e. diseases not normally present in the UK, such as Foot and Mouth Disease) (<https://www.gov.uk/government/collections/notifiable-diseases-in%20animals>; accessed: 21.09.16). Farmers are legally required to notify authorities. In the UK farmers report to the Animal and Plant Health Agency (APHA) if a notifiable disease incidence is suspected. Non-notifiable diseases include infectious diseases such as Bovine Viral Diarrhoea

²² http://ec.europa.eu/agriculture/newsroom/271_en.htm accessed on March 2016

²³ Code of recommendations for the welfare of cattle

(BVD), Leptospirosis, Infectious Bovine Rhinotracheitis (IBR) and Paratuberculosis (Johne's disease) and endemic non-infectious diseases (i.e. production disorders), such as mastitis, lameness and fertility. Much of the regulation related to cattle diseases covers control of notifiable diseases. As one interviewee from the British Cattle Veterinary Association (D13) noted, there are very few regulations for most non-notifiable cattle diseases. For instance, there are no specific regulations for lameness, mastitis or fertility. There are no regulations for infectious diseases such as BVD or Johne's disease. Instead good practice guidelines exist, supported by advice and input from private vets. Milk buyers often have requirements regarding milk quality that cover production disorders. For instance, bacterial contamination cell counts are required as part of milk quality checks, which indicates sub-clinical mastitis. Supermarkets and other retail customers will also have certain expectations and will require dairy farmers to meet minimum standards in terms of lameness, housing, etc. which are often included in milk contracts or via farm assured standards.

Animal health pressures and compliance with biosecurity regulations are therefore a key production issue for dairy producers. As noted by a number of interviewees (D1, D2, D4, D6), the most significant piece of animal health regulation that impacts dairy farms concerns bTB. bTB has serious consequences for cattle farmers. In 2014 11.1% of herds in Great Britain were not officially bTB free, leading to the slaughter of 32,858 cattle (DEFRA 2015). Analysis of bTB disease spread shows that most counties in the west and south-west of England are endemic, including Somerset (Enticott *et al.* 2015; Fisher *et al.* 2012). The increased spread of bTB over the past 20 years or so has been attributed to the transmission of the disease from badgers to cattle. However, other factors have also been identified, including cattle movements and farm management and animal husbandry (Fisher *et al.* 2012). The UK has a national control plan for bTB and legislation which underpins it (DEFRA 2013b), including animal movement restrictions, compulsory testing and other biosecurity measures (Maye *et al.* 2014). Interviewees regarded animal movement restrictions as particularly significant and delimiting for dairy farms. Movement restrictions can make it difficult to move and sell young calves, for example, pre- and post-movement testing is required on farms, and bTB testing is costly, disruptive and emotionally draining, particularly if farms are on a 60-day testing cycle. This legislation has a significant impact for dairy farms in counties, such as Somerset, where the disease is endemic, as farms are more likely to be put on 60-day testing cycles with movement restrictions.

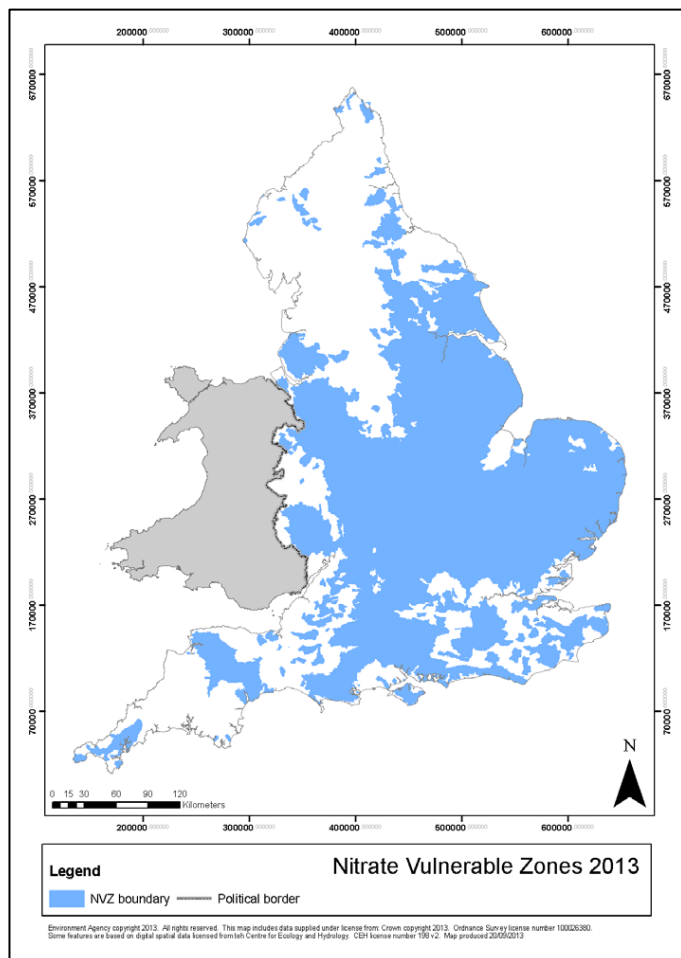
5.2.5.3 Water Framework Directive

The EU Water Framework Directive (Dir. 2000/60/EC) requires measures for mitigating point and diffuse pollution, in order to ensure that water bodies meet environmental quality standards (Fezzi *et al.* 2010). In the UK, one of the major challenges for the implementation of the directive is the reduction of diffuse pollution from agriculture. In the case of dairy farmers, the main source of pollution comes from nitrates from livestock manure. Under certain unpredictable weather conditions, such as flash floods, slurry tanks may overflow, with the contents washed into water bodies in the local area. This may cause an excessive amount of nitrate pollution. The Nitrates Directive (see below) covers nitrates but the Water Framework Directive covers a wider range of diffuse pollutants that may impact the water environment / water cleanliness. As one interviewee put it, "this is picking up on phosphates and other minerals [in addition to nitrate] that were getting in...it's setting a standard for water purity" (D: Interviewee 1).

5.2.5.4 Nitrates Directive and Nitrate Pollution prevention

Nitrate Pollution Prevention Regulations 2015 (SI 668-2015) came into force on 1 May 2015 (Beharry-Borg *et al.* 2013). In total, 62% of the land area of England was designated as Nitrate Vulnerable Zones in 2010. This was mainly due to high concentrations of nitrates from fertilizers and manure. Figure 23 shows the Nitrate Vulnerable Zones in England for 2013.

Figure 23. Nitrate Vulnerable Zones in England, 2013



Source: Defra (2013c)

If a dairy farm is within an NVZ zone the regulations are prescriptive regarding allowable nitrate levels and farms must have adequate slurry storage (6 months), which has meant significant investment costs for some farms. Fezzi *et al.* (2010) estimated the economic impact of measures to reduce nitrate leaching and found that costs of implementing measures may differ significantly across and within farm types, according to the individual characteristics of each farm. This variability is the result of the mixed conditions under which farms operate.

5.2.6 Food safety, antibiotics and marketing standards for milk consumption

The UK Food Safety Act of 1990 is an important piece of legislation for the dairy supply chain. The Act defines the traceability standards required for food safety. Traceability can benefit high-value dairy producers who want to diversify their product from others, monitoring where their milk is processed and/or which are the most successful commercial strategies. Hygiene and safety standards are a priority on dairy farms to prevent contamination. Milking operations, for

instance, should follow the basic principles of cleanliness as set out in the EU regulations.²⁴ There are also requirements in place for milk transfer and storage, the details of which are usually set out in milk contracts. Requirements include, for example, that milk should be quickly cooled to minimize bacterial multiplication.

During the interviews antibiotic and veterinary medicine residues were noted as an increasingly important issue. As one interviewee, from the British Cattle Veterinary Organisation (D13) explained, the use of antibiotics and the issue of antibiotic residues needs to be set against a wider context and emerging public concern about anti-microbial resistance. Antibiotic and veterinary medicine residues are closely monitored in dairy supply chains. Maximum residue limits (MLR) are set and all milk that leaves a farm is required to be below the MRL, for both antibiotics and all other medicine residues. In terms of veterinary standards, animals treated with a veterinary product should be identified and records of the use should be kept and updated within 72 hours, specifying: 1) date of administration; 2) identification of animals; 3) product name; 4) quantity used; and 5) milk withdrawal period. Records of feed supplies, diseases that may affect the safety of milk, sample results and checks made must also be kept. The FSA regularly inspects holdings and dairy farms have to communicate any changes to the production of products for human consumption.

The Single Common Market Organization Regulation specifies marketing standards for drinking milk and includes rules for the use of whole, semi-skimmed, and skimmed milk designations (Barkema *et al.* 2015). Drinking milk can be supplied as: 1) raw - not heated above 40°C or treated for the same effect; 2) whole - heat treated with the fat content of at least 3.5 per cent; 3) semi-skimmed - heat treated with fat content of between 1.5 per cent and 1.8 per cent; and 4) skimmed - heat treated with fat content of 0.5 per cent maximum. Milk can be modified by: 1) changing the fat content by adding or removing cream, or by mixing with whole, semi-skimmed or skimmed milk; 2) enriching with milk proteins, mineral salts or vitamins; and 3) reducing the lactose content by converting it to glucose and galactose. These standards are important for the milk chain but do not impact dairy farmers directly.

5.2.7 Social issues in dairy linked to policy and regulation

A number of social and demographic issues emerged from the desk review and interviews which are linked, in part at least, to regulation and policy, or which concern regulation and market conditions that are socially orientated. The first issue concerns **tenanted dairy farms**. Tenancy agreements, for example, have user clauses and some may stipulate that the farm must remain a dairy farm. It was thought unlikely that a landlord would be strict about this if a tenant needed to change to stay in business, although it may be something enforced if the landlord wanted to get rid of the tenant. Some dairy farms that have come up for tenancy has stipulated that the tenant must have a milk contract in place, to guarantee likely viability (D4). Across the tenanted dairy estate it was noted that there is a general lack of investment in new equipment/parlours. There are a number of different tenancy arrangements, particularly as dairy farms who are expanding rent extra blocks of land. This adds complexity to the way dairy farms are managed.

²⁴ These are: 1) making sure teats, udders and adjacent parts are clean before milking; 2) using pre- and post- milking teat disinfectants (teat dips and sprays) according to the manufacturer's instructions; 3) keeping dip cups and spray devices visually clean; 4) cleaning excessive dung from floors and stallwork; and 5) keeping milking equipment clean at all times.

With the loss of milk quota, dairy cows are now a tenant farmer's main asset, and this can be impacted if milk prices drop.

The second issue concerns **succession and strategies for entry to and exit from the sector**. Succession emerged as an important issue, particularly during the interviews. Several interviewees regarded succession as a difficult and emotive issue that can significantly constrain the development of an individual farm business, as well as the sector. The following quote, from a regional manager for Barclays, summarises the situation well:

"[Farmers are] not very good at handing over, so you will see situations where 80 year old dad is still in charge, 60 year old son does the work, 40 year old grandson hasn't got a clue, just does what he's told and you think somebody needs to let go and hand this down [...] It's getting less [to see this situation]...but it's still the majority I would say" (D: Interviewee 11).

It was noted earlier that dairy farmers are exiting the sector. Interestingly, as noted in interviews and at a national stakeholder meeting, not all exits are because producers are bankrupt – some exit because they realise there is better money to be made doing something else. In other words, exiting may be the best strategy, or because the producer is not willing to do the work required for the level of reward. That said, some dairy farms are 'locked in' because of heavy investment or because they have not borrowed heavily and because of this are able to ride out the storm. The issue of attracting new blood into dairying was mentioned, particularly during the interviews. Joint ventures, partnerships and matching schemes were discussed, the latter in particular to encourage new entrants into the sector.

A third issue concerns **paperwork, farm management skills and farming lifestyles**. Interviewees commented that farmers are good at farming. However, some struggle to manage the paperwork side of the business (managing the paperwork needed for EU and UK regulations and related standards, for example). It was noted that often the farmer's wife/partner may be the one dealing with the paperwork/business side of the farm. The need for good farm management was identified as a key asset for farmers, particularly to manage price volatility. A number of interviewees made the point about needing to get farmers to better respond to market signals, which includes managing their own business but also thinking about what the market wants, focusing sometimes less on quantity of milk, and working together more. As two interviewees usefully put it:

"[T]he key to any farm these days is to look at who you are supplying and what do they want. This is something farmers are incredibly poor at actually because they're not market orientated. They don't think that way. They live to farm. And they don't think about the market or business" (D: Interviewee 1).

"What's been really interesting is, in this country, and Ireland, and across Europe, quite a lot of farmers have been looking at their own situation in isolation and saying, do you know what, the milk price is coming down, I've already got my overheads covered, with what I'm doing, actually, when I work it out, the best thing I can do is go and get another 20 cows or 30 cows or whatever, to produce more milk" (D: Interviewee 8).

There was discussion too about the way dairy farming is a lifestyle as much as a business, although some suggested this was changing, particularly for larger dairy farms:

“In this country, unlike in New Zealand, I think we are very brought up that farming is a way of life and it's not a business... Like my Dad farmed, my grandfather farmed it, we've always been dairy farmers and always will, but in New Zealand, dairy farming it's a business, like money comes first... Lifestyle's very important but if you're not making money why are you going to carry on...but then people are very attached, it is still a way of life, even though it is a business (D: Interviewee 6).

“Farmers as they go larger are just going more professional and whereas before it they ran it as a way of life and it was a culture and a massive shame if they were forced out of the industry. I think more that you'll get a slow generational change to say, well, I'm in it for a business, I'm only being awarded according to commodity valuations, that's how society judges me, I'm not going to crucify myself at this game, and they are taking a much more pragmatic approach” (D: Interviewee 12).

5.3 Market conditions of dairy producers

Global, European and UK dairy markets are strongly integrated and changes in production volumes, supply and prices in one place can have repercussions on the dairy sector at the opposite side of the globe. During the interviews recent drops in milk price were linked to the Russian trade sanction and oversupply of milk on the global market, for example. In short, UK dairy is embedded within and more exposed to global commodity markets. Moreover, given the seasonality of production and the fresh nature of dairy products, market changes can frequently occur. From 2003 to 2013, world milk production increased by about 23%, but in the same period the EU's global market share reduced from about 29% to about 24% (Table 6). This loss in global market share also impacted the UK, which dropped from 2.9% to 2.2%.

Table 6. Global milk production 2003, 2012 and 2013

	Billion litres		
	2003	2012	2013
World	503.2	612.0	617.2
EU-15	118.8	118.5	120.1
EU-25	140.2	140.3	142.0
EU-28	146.0	145.5	147.3
UK	14.4	13.4	13.5
EU-28%	29.0	23.8	23.9
UK%	2.9	2.2	2.2

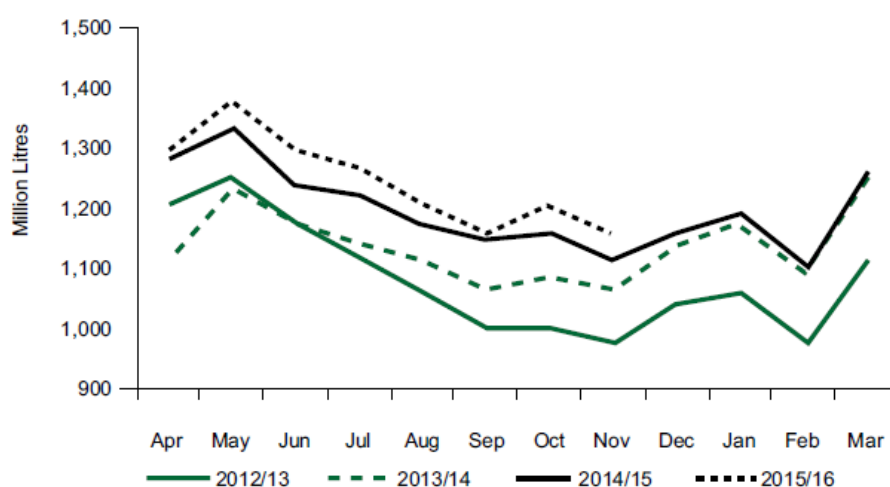
Source: AHDB (2015)

Despite the loss in market share, both the EU as a whole and the UK in particular are still major global dairy producers, and production volumes in the UK are relatively stable (Figure 24). From 2013/14 to 2014/15, the UK's milk production increased by 5.4%. One of the reasons for this significant increase in production volumes is the high milk price in 2013/2014, which encouraged

farmers to boost production by expanding their herd, for example (AHDB 2015). Given the overall reduction in numbers of dairy farms in the UK, increases in supply indicate an intensification of dairy farms' production systems. It also suggests that UK dairy producers are quick to respond to market signals, taking advantage of price opportunities. However, it can also create exposure to price fluctuations. Balancing and responding to market signals is a real challenge for the sector, as noted by the following interviewee:

"[M]ost manufacturers of things are working to set contracts, to set volumes...[w]hereas with milk, dairy in particular, when things are good, they say well we want every damned last liter you can produce and then find some more. And it's a very, very slow response. The signals are very, very poor forwards and backwards" (D: Interviewee 1).

Figure 24. The UK milk production volumes from 2012/13 to 2015/16



Source: Defra (2016)

The higher production volumes in 2014/2015 were followed by an increase in dairy exports, turning the overall UK dairy trade balance from negative to positive (Table 7). The positive trade balance was mainly driven by liquid milk, while imports of cheese and butter exceeded UK exports (Bates 2016).

Table 7. UK dairy imports and exports over the period 2004-2014

	Thousand tonnes					
	Imports		Exports		Trade balance	
	2009	2014	2009	2014	2009	2014
Cheese	419	467	105	134	-314	-333
Milk & Cream	158	221	539	654	381	433
Butter	96	95	27	51	-70	-44

Source: Bates (2016)

While 2013/2014 was characterised by high production volumes and promising market prices, in 2014/2015 the average milk price dropped by about -4.8%, resulting in a loss of £107.4m of total revenues. The negative effects of low milk prices were further exacerbated by a significant reduction of the per capita consumption of liquid milk in the EU-28, which reduced the overall demand for dairy with respect to the volumes available (Table 8). The low EU prices and drop in consumption of dairy products were coupled with other international conditions: a worldwide

oversupply of milk; the slowdown in Chinese demand; the Russian ban on EU foods; and the increase in production levels across the EU due to the removal of EU quotas (D2, D3, D10, D12). This combination of events constituted a “perfect storm” and initiated a period of crisis for the UK dairy sector which continued into 2016.

Table 8. UK consumption of dairy products over the period 2003-2013

	Unit	Average purchase (quantity/head/annum)		
		2003	2012	2013
Total liquid milk	Litres	86.6	78.3	74.7
Whole milk*		30.4	15.4	14.8
Semi-skimmed milk		48.2	54.7	51.8
Skimmed milk		8.0	8.2	8.1
Yogurt and fromage frais		9.2	10.1	10.0
Cream		1.0	1.3	1.2
Butter	kg	1.8	2.1	2.2
Cheese		5.9	5.9	6.1

*Includes full price whole milk and excludes school and welfare milk, includes UHT (Ultra Heat Treated).

Note: These figures only measure dairy products consumed in the home. It does not include those consumed out of the home or as an ingredient, e.g. cheese in a ready meal.

2013 data is the latest available at the time of publication.

Source: AHDB (2015)

However, the unpredictability and volatility of dairy markets are not always negative and unfavourable conditions can improve if some markets change. At a European level, for example, EU dairy producers may benefit if the bilateral EU-Mercosur trade deal goes ahead, as the Mercosur is a net importer of dairy products (AGRAFACTS 2016a) and trade negotiations post-Brexit may open up new markets for UK dairy producers.

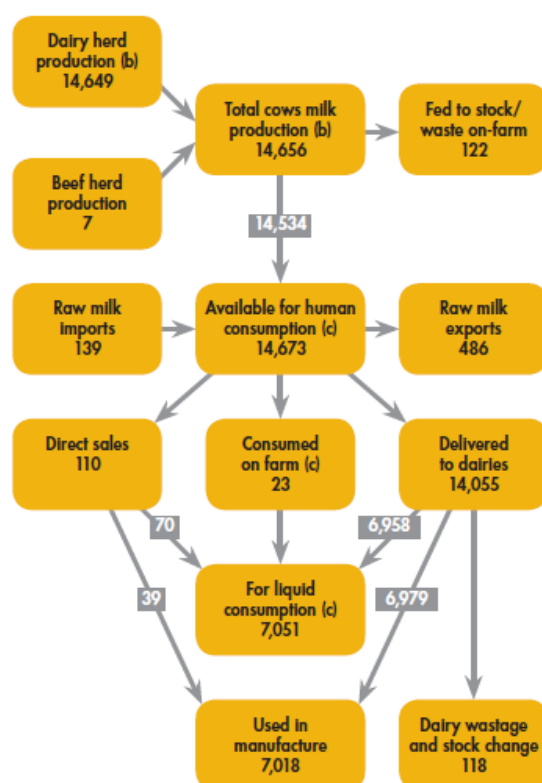
5.3.1 Production and inputs costs of UK dairy farmers

UK dairy farmers operate at higher average production costs than other global and EU producers, such as France, Germany and Ireland. The extra cost in the UK is 4 pence per litre (ppl) with respect to the global average. However, costs of production vary from farm to farm and they also change from year to year (DEFRA 2016). These differences in production costs can affect UK dairy farmers’ competitiveness and their ability to remain in the market. The key components affecting production costs are herd replacement costs, feed and forage costs, labour costs and power/machinery costs (D2, D3, D12). In the last ten years, total dairy production costs followed an upward trend, but since 2014 this trend has reversed. Total fixed costs have continued to increase by about 2% per year, but with differentiations: while labour (2%), contracts (7%) and rents (4%) have increased, machinery depreciation and other machinery costs have fallen by -1% and -4% respectively (McHoul *et al.* 2016). On the contrary, total variable costs fell by 5.5%. The most notable inputs which showed a cost reduction on the previous year were purchased concentrates (-8%), coarse fodder (-22%), seed costs (-12%) and fertilizer costs (-7%) (McHoul *et al.* 2016). The overall reduction in inputs costs has helped to mitigate the negative effects of low milk prices, at least by reducing the margin of losses.

5.3.2 The UK dairy supply chain

Dairy products in the UK are consumed and delivered in a variety of forms, involving a large number of actors from the farm to the table, and thus creating a complex supply chain. The main elements of the UK dairy supply chain are summarised in Figure 25.

Figure 25. The supply chain for UK dairy products
UK milk flow 2014 (million litres) (a)



(a) Figures are provisional.
(b) Excludes any suckled milk.
(c) Includes 7 million litres of milk produced by the beef herd.
Note: Totals may not agree due to rounding.

Source: AHDB (2015)

UK domestic milk production is not sufficient to fulfil demand for dairy products, with milk from UK dairy farms supplemented by imported milk. The bulk of available milk, including imports, is almost entirely transferred to dairy industries and cooperatives which transform half of the raw milk supplied into manufactured dairy products (e.g. cheese, yogurt, desserts), with the remaining raw milk pool treated according different specifications and sold as liquid milk for human consumption. The most successful manufactured dairy products in the UK are cheese (+19%) and cream (+13%), while the production of other traditional products such as milk powder and condensed milk has decreased (see Table 9).

Table 9. UK production of dairy products, 1994-2014

	1994	2014	% change
Liquid consumption	6,773	7,028	+4%
Butter	292	288	-2%
Cheese	3,251	3,866	+19%
Cream	265	301	+13%
Condensed milk	751	270	-64%
Milk powder	2,098	1,562	-26%
Other manufacture	632	732	+16%

Source: Bates (2016)

Over 70% of UK dairy products are produced in consumer packs for sale, of which the majority is fresh liquid milk distributed through a chilled chain (Dairy UK 2013). The dairy industry also provides a diversified offer of packed liquid milks, which are branded according to quality, health, ethical and provenance attributes (Dairy UK 2013). The variety of milk products now on the UK market has been taken by some as an indicator that healthy eating is a key driver for the dairy industry (Dairy UK 2013). The trend towards lower fat dairy products started some time ago, with semi-skimmed and skimmed milks, but more recently has developed significantly, with 1% fat and below liquid milks in demand, as well as low fat “lighter” cheeses (Dairy UK 2013). Provenance attributes, especially locally supplied products, are also important in the UK dairy market. To satisfy growing demand for provenance products, in 2010 the UK food industry developed a Voluntary Code of Practice on country of origin labelling for meat and dairy products. The development of the code was facilitated by Defra (Dairy UK 2013).

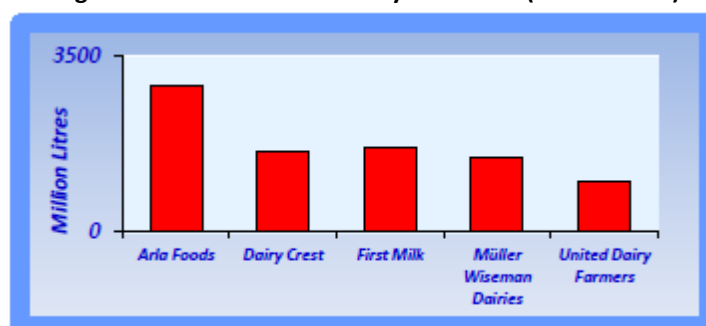
Overall, the dairy sector concerns mainly fresh and highly perishable products which need adequate logistical organisation to be distributed daily over the UK. UK milk is collected from farms by milk hauliers using a fleet of approximately 1,300 vehicles driven by over 2,000 drivers. Milk collection vehicles are typically operated by hauliers contracted by milk purchasers, and around 15% of the vehicle fleet is owned and operated by milk purchasers themselves (Dairy UK 2013). Specific standards and certifications for the transport of dairy products govern this process, the main elements of which are described in Section 5.3.6.

Whilst farmer engagement in processing is rising, almost 91% of UK milk is purchased and processed by processing facilities, which process over 100 million litres of milk (Dairy UK 2013). There are five major organisations leading the UK dairy industry. Three are UK co-ops: Arla Foods, First Milk, and United Dairy Farmers; one is a public UK company: Dairy Crest; and one is a German-based private company: Müller Wiseman Dairies. The UK dairy industry and supply chain is therefore characterised by a relatively low level of concentration compared to continental counterparts, hence further opportunities for industry rationalisation and merges still exist (Dairy UK 2013). UK dairy processors typically have direct links with dairy farmers and purchases are often ruled by specific contracts (see Section 5.3.4), but not all milk bought from farmers is processed by the purchaser; the purchaser can sell the liquid milk to other companies for processing. A disparity between the volumes of milk purchased and the volumes of milk processed is therefore common (Dairy UK 2013). For example, Arla Foods is the main milk purchaser and processor of UK milk, First Milk buys much more milk than it actually processes

and Müller Wiseman Dairies process more milk than the volumes bought directly from farmers (Figures 26 and 27) (Dairy UK 2013).

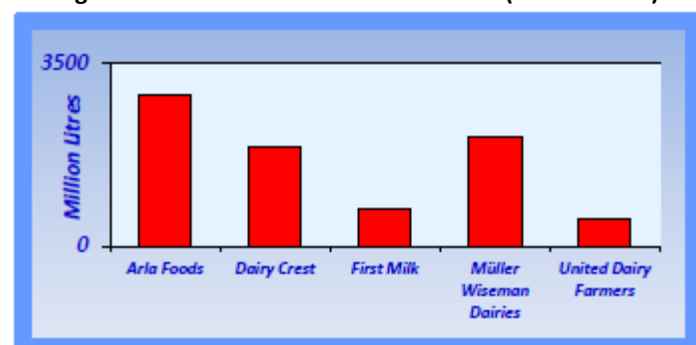
A substantial percentage of UK milk goes into the ingredients sector e.g. biscuits, cakes and ready meals. This sector is diverse and fragmented but continues to grow as consumers eat more processed and prepared foods (Dairy UK 2013). In addition, the industry pays careful attention to the school and nursery milk market. Initiatives to encourage milk consumption at school age, for example, are supported by the EU and UK authorities. The current subsidy rates of the EU School Milk Subsidy Scheme are €0.187 per litre from the EU with a further 3.98p per litre “top-up” from the UK Government (Dairy UK 2013). The most important customers for UK dairy farmers are retailers, followed by wholesale distributors, catering outlets, institutional customers (hospitals, schools, and prisons), food processors and traders (Dairy UK 2013). The UK retail market is dominated by four major supermarkets (Tesco, Asda, Sainsbury’s and Morrisons), accounting for 76% of all dairy sales in the UK (Figure 28).

Figure 26. Volume of Milk by Purchaser (million litres)



Source: Dairy UK (2013)

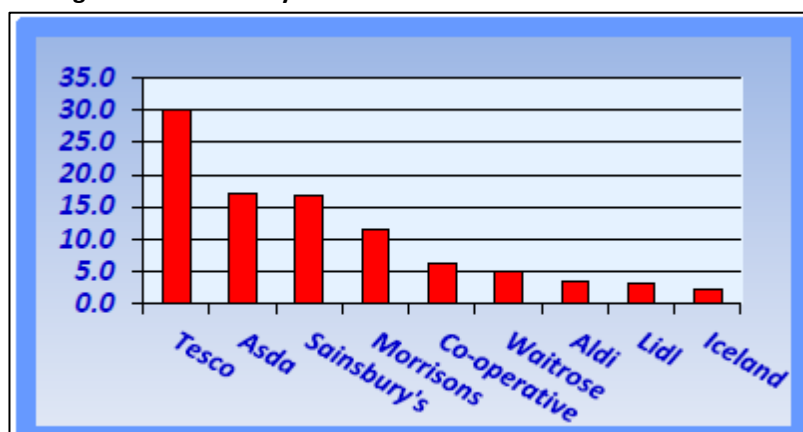
Figure 27. Volumes of Milk Processed (million litres)



Source: Dairy UK (2013)

Only a small proportion of the industry’s total output is sold directly to consumers via doorstep delivery service or through local markets. Between 1995 and 2015, doorstep delivery declined from 45% to 3% of the retail milk market. This decline has been accompanied by a growing price differential between supermarkets’ milk and doorstep delivery. In the UK in 1995, the average cost of a pint of milk at the doorstep was 37.9p and 23.9p from retailers. By the end of 2015, a pint of milk cost 81p at the doorstep and 24.8p from retailers (Bates 2016). Several major retailers have put in place ‘integrated supply arrangements’, meaning that a retailer buys liquid milk exclusively from a specific group of farmers. Under these arrangements, farmers generally receive a higher price, which varies from retailer to retailer (Table 10).

Figure 28. UK dairy market share of retailers



Source: Dairy UK (2013)

Table 10. Milk pricing systems of major UK retailers (2013)

Retailer	No of Farmers	Pricing System
Marks & Spencer	40	Formula taking account of costs and market returns
Waitrose	60	Negotiation taking account of capital investment requirements
Asda	250	Premium over processor standard prices shared over processor's total non-aligned supply pool
Sainsbury's	325	Quarterly review of key farm input costs
Co-op	350	Premium over processor standard price
Tesco	700	Formula taking account of costs and market return
Morrisons	-	Premium over processor standard prices shared over processor's total non-aligned supply pool

By taking part in such arrangements dairy farmers can obtain a partial insulation from the volatility of market prices. In exchange, farmers may be required to produce and deliver milk according to specific animal welfare and/or environmental standards as set down by the retailer, or to share detailed information on farm performance data (Dairy UK 2013). Given the high volumes of milk purchased by Tesco, the farm-gate price set by this retailer is seen by many as setting a benchmark for the whole industry (Dairy UK 2013).

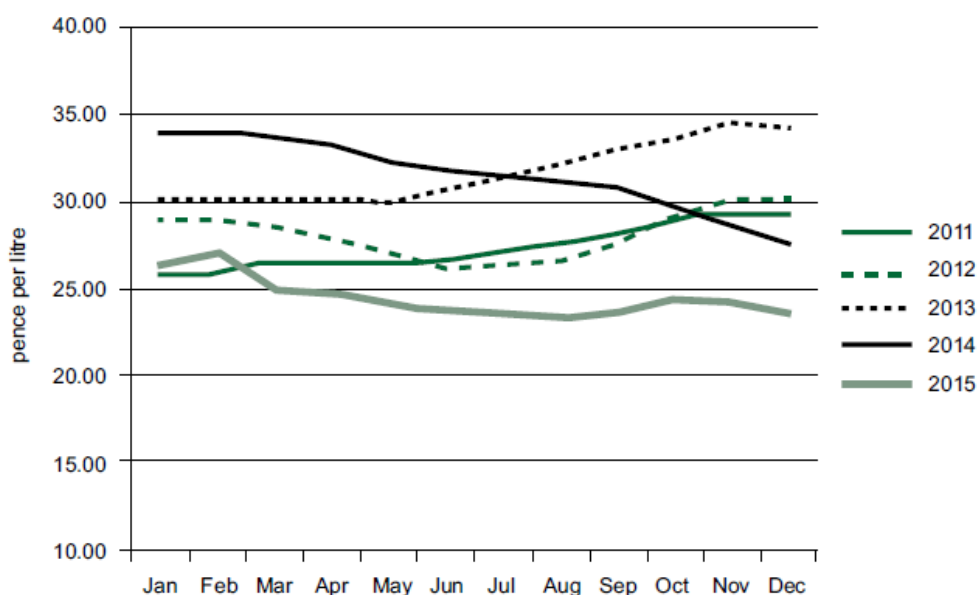
5.3.3 The UK dairy price crisis, asymmetric price transmission and price volatility

Milk price is currently a major and sensitive issue for dairy producers. As noted earlier, the UK dairy sector has faced a severe crisis since 2015, characterised by very low milk prices. In 2015 there was a SOS Dairy Campaign and a number of well publicised farmer protests at leading supermarkets and processors. Farmers argued that the price they were receiving for their milk was not sufficient to cover production costs. The reasons behind low milk prices (lower global demand of milk combined with milk oversupply, the ban of dairy exports to the Russian market, the deregulation of the EU milk quotas) were noted during the protests and in subsequent media coverage. Interviewees commented that the SOS Dairy Campaign helped to raise awareness

about the crisis facing many dairy farmers. However, it was suggested that the farmers who benefited from subsequent actions by supermarkets were not necessarily the ones most in need (i.e. farmers on aligned contracts). Interviewees also noted that when milk prices are discussed the price of milk per se is not the issue but more margin and profitability.

As discussed in the policy section, price support has been an essential feature of the dairy sector (Banks and Marsden 1997), shaped until recently by a series of policies that were strongly interventionist. With the abolition of milk quota, policy and regulation regarding milk price is now non-interventionist. With the current reduction of policy intervention at the EU level, the variability of milk prices has become more evident and the removal of the quota system has made the sector more susceptible to changes in international markets. The average farm-gate milk price in the UK has fallen by more than 10p per litre (ppl) from its peak in late 2013, reaching 23.71ppl in December 2015 (see Figure 29). With an average cost of production of 25ppl, some producers find it difficult to cover the cost of milk production (DEFRA 2013a).

Figure 29. The evolution of UK farm-gate prices 2011-2015 – price per litre



Source: Defra (2016)

However, farmers receive different prices depending on the buyers and product quality (see contracts section below). Milk price crisis is not the only problem related to dairy prices. There are two further issues to consider: asymmetric price transmission and price volatility. In relation to the first issue, when discussing dairy prices in the UK, it is important to distinguish between three price categories: 1) farm gate prices; 2) wholesale prices and; 3) retail prices. These price categories are interlinked as they reflect three steps in the UK dairy supply chain. It is assumed that within the supply chain price transmission is symmetric – i.e. dairy prices evolve simultaneously passing from one node of the supply chain to the next. It is also assumed that prices are set at the farm-gate level, and that wholesalers (processors) and retailers add a fixed 'mark-up' to cover their costs and to enable profit. These assumptions are often far from the reality. The dairy supply chain is characterised by asymmetric price transmission – i.e. prices at different stages of the chain do not move up and down in line with each other (Ruslan 2011). Asymmetric price transmission is due to: differences in market power between supply chain

actors; differences in market and cost structures across actors; government intervention; and the value added by manufacturing of dairy products with respect to liquid milk. For these reasons, the price received by farmers can be disproportionate to the price of the final product sold in supermarkets.

Regarding milk price volatility, in the last ten years it has increased in the EU and in the global market (Tangermann 2011), which coincided with a progressive reduction of farmers' protection towards a more market-oriented EU agricultural sector (Bardaji 2011). Price volatility can lead to market risks and to increased uncertainty that have undesirable effects on farmers' investment decisions (Tangermann 2011), sourcing strategies of retailers and/or processors, and food consumption (Hernandez *et al.* 2014). Among the factors that contribute to price volatility there are: trade restrictions in major producing countries; climate hazards; and animal health scares. These factors can provoke unexpected changes in the supply and demand of milk, and consequently lead to sudden increases/decreases in milk prices (Bardaji 2011). Price volatility is often considered a negative issue related to low prices and income instability. However, price volatility can also be advantageous to those who can seize opportunities and build strategies around it (Assefa *et al.* 2015). The risky nature of price volatility is a function of three factors: the persistence of price fluctuation; the reason why prices continuously change; and the direction of price deviations (Assefa *et al.* 2015). For example, the long term persistence of price volatility over one year or over more production cycles can delay the return on investments (Assefa *et al.* 2015).

To understand why UK dairy farmers are particularly exposed to price volatility, it is important to understand the peculiarities of the UK dairy market. About 65% of dairy production in the UK is sold as liquid milk, and only 25% is turned into cheese and 10% into powders and butter. This contrasts with the rest of Europe, where only 30% of dairy production is sold as liquid milk. Since liquid milk cannot be easily stored as milk powder or cheese or butter, UK farmers tend to be more affected by volatility and global market changes (DEFRA 2016). As two interviewees put it:

"Trade is defined by a very few supermarkets and it's competitive and milk happens to be a very competitive market" (D: Interviewee 9).

"It's a global market. You cannot get away from the fact that whatever's happening in Australia, New Zealand, Russia, China, has a direct impact on this now. It's almost a cliché isn't it, we're in a global market, but we definitely are..." (D: Interviewee 8).

When prices are low, farmers' production decisions can be affected, influencing farms' productivity. For example, a recent study showed that with low milk prices, high-yield systems reliant on expensive concentrate feed may not provide the expected financial returns. 25 Concentrate-based systems are more productive but low milk prices can fail to cover production costs. On the contrary, lower yield forage-based and grazing-based systems can still provide profits. This suggests that market risks are critical drivers of: i) farmers' production and management strategies; ii) adaptation strategies; and iii) adoption of productive systems. As a consequence, in the long run, low prices can also affect investments in more productive innovations, affecting the long term improvement of dairy productivity. Some interviewees (D1,

²⁵ <http://www.fwi.co.uk/livestock/high-yield-lower-forage-dairies-don-t-make-financial-sense.htm>

D11) argued firmly that rather than comparing systems the key thing that differentiates dairy farms is management of the unit (finance, inputs, managing markets, etc.).

A final issue concerning milk prices is the “price war” between supermarkets. Supermarkets sell milk at a discounted price relative to their competitors in order to attract consumers into their stores. Milk is effectively a loss leader. Milk demand in the UK is quite inelastic, meaning that the volumes of milk sold do not change dramatically if milk prices change, because milk supply in the UK is a staple good (DEFRA 2016). The “price war” reflects asymmetric price transmission. Supermarkets are transparent in stating that the retail price is not necessarily related to the farm-gate price. Only 7% of the milk produced in the UK is sold on the basis of a pricing mechanism which relates to the cost of production. This mechanism is followed by Tesco, Sainsbury’s, Marks & Spencer, Waitrose and the Co-op, which all have long-established relationships with supplier groups (see Section 1.3.2); meanwhile, Asda, Morrisons, Aldi and Lidl have a minimum price for liquid milk, and milk supplies can come from any producer which accepts the minimum price (DEFRA 2016).

5.3.4 Contracts, A and B pricing and futures

Contractual relationships in the UK dairy industry are highly developed. Dairy farmers can engage with the dairy industry through a variety of contract types. Contracts can be individual or collective. In the latter case, the contract concerns a group of farms and the members can benefit from improved bargaining power. The main benefit of production contracts for farmers is achieving a degree of price stability, by agreeing in advance the purchase price. This provides a certain degree of protection from price volatility. However, contracts can also have disadvantages. For example, producers can face penalties if they decide to exit the contract before the signed ending of the agreement. Moreover, contract prices can vary depending on the farm’s production scale and location (Wilson 2010). Indeed, large conventional milk producers in the UK lowlands can obtain higher milk prices over smaller-scale LFA producers, thanks to the higher number of buyers present and the competition among them. Similarly, organic producers can receive a price premium over conventional milk, but these producers can be restricted in the number of buyers available and contracts can have longer penalty periods. In 2010, 29% of milk producers were unhappy with their milk contracts (Wilson 2010).

To enhance contractual relationships within the supply chain, the industry agreed the Dairy Industry Voluntary Code of Best Practice on Contractual Relationships in September 2012. The code was developed to improve equity of contractual relationships and to provide an alternative to the government regulation of contracts. Adoption of the code is voluntary but currently involves 85% of UK milk purchasers (Dairy UK 2013). The code provides purchasers with greater flexibility in deciding purchase prices according to developments in the market place and farmers can in theory obtain fairer prices and security and continuity with respect to market access (Dairy UK 2013).

During stakeholder interviews contracts and the variability in milk price between farmers based on whether they are aligned or not to a **supermarket or production contract** was a key issue. In the interviews the example was given where you have one farmer on 30p per litre and a neighbouring farmer on 20p or less, simply because one farmer is aligned to a contract. The following quotes reflect this difference and the increasing role of contracts:

"I've got people that are on that Sainsbury's contract and obviously they've been able to invest in their farm, they can buy new machinery, they can invest in buildings and stuff like that. People that are just on like liquid milk contracts, supplying the likes of like Muller, and people like that, they just have to ride the market out don't they" (D: Interviewee 6).

"You could be a really good farmer, but if you, you don't have to get many decisions wrong, and you could come really seriously unstuck, because a lot of it depends, like now there's some really, just as good farmers, but if they're selling into a commodity cheese market, compared to on a Sainsbury's contract its [very different]" (D: Interviewee 3).

"The contract is now very important. It didn't used to be, because it was only two or three years ago when if you didn't have a contract, or didn't like a contract, you moved to somebody else and they would take you. Nowadays, if you lose your contract, you probably can't find anybody who will take your milk" (D: Interviewee 10).

During the SOS Dairy Campaign, interviewees noted that farmers on contracts did not protest. Some interviewees suggested that farmers who were part of contracts got lucky, and/or it was down to timing or appropriate geographical location for a supermarket or processor. It is not possible at the moment to get new supermarket aligned contracts. There are two conditions that make negotiations difficult when they are available. First, primary producers have less flexibility to exploit economies of scale unlike retailers. Second, there is a sole-trading business culture and mentality amongst farmers in the UK, which has developed because of a long history of guaranteed prices. As noted earlier, producer organisations are a potential route for improving bargaining power and reducing the price taker position that many dairy farmers currently find themselves in, but uptake so far has been slow to materialise.

The other interesting market arrangement is **A and B pricing**. This is a pricing matrix with a core price and a market realisation price. There is some debate about whether A and B pricing is the best way forward, or whether it would be better to just have one price. Some interviewees argued that A and B pricing was an attempt by processors to manage supply. The B price is worked out using the Actual Milk Price Equivalent and is usually low (e.g. 17ppl). It is payment for what some termed 'marginal litres' (e.g. D3). One argument is that you should not chase marginal litres – it is best to focus on achieving core litres. Some processors also use A, B and C pricing. Prices are worked out on what the farm produced last year. This provides the benchmark and core price for the current year, or whatever the processor agrees to take. If you produce beyond that you get a much lower B price. If you fall below the benchmark you get penalised on the core price (C price). This was viewed as unfair by farmer representatives. That said, interviewees were generally supportive, in the sense that they balance supply:

"I'm quite pleased that we've got A/B contracts in place now [...] Because what that does then is it actually stops people just producing more to try and balance it out. That's not very good for everybody I know but I think that makes, at least the solution isn't produce more which makes it worse" (D: Interviewee 11).

Another form of contract which is being discussed in the dairy sector, especially after the abolition of milk quotas, is **futures markets**. Futures contracts exist for butter, skimmed milk powder (SMP) and whole milk powder (WMP). A futures market (DEFRA 2016) is an organised

auction market for trading futures contracts. Futures contracts include “a commitment to accept or deliver a specified quantity of a commodity at a specified time, for a specific price”. There is no actual commodity exchange unless and until the contract comes through. Overall, the use of futures contracts is not well developed among UK farmers. This is because a futures contract still has elements of uncertainty, although the degree of uncertainty faced by farmers is lessened. For example, if a farmer agrees to be paid a certain price he or she will only receive the amount agreed at the time the contract was agreed as stipulated in the terms of conditions. If by then, average prices have increased, the farmer will be transacting at a loss. On the contrary, if the average prices have decreased, he or she will have increased his/her profit. In this regard, futures contracts help in planning cash flows, as they help farm business management on the basis of a guaranteed income for the milk commodity.

5.3.5 Organic dairy production

The story of organic milk is different to conventional milk. Similar to supermarket-aligned conventional dairy farmers, the price for organic milk is currently good. The situation was different a few years ago when some organic milk producers exited and returned to conventional. This is not the case now. The UK is the second largest organic dairy market in the EU, involving about 11% of dairy producers (OMSCo 2015). In 2014/15 organic producers were favoured by increasing incomes and margins, while conventional dairy farms saw declines in incomes and margins (McHoul *et al.* 2016). This difference in performance is due to differences in variable and fixed costs. Variable costs decreased by 6% on conventional farms, but decreased by 11% on organic farms. In contrast, fixed costs increased by 2% on conventional and by less than 1% on organic farms (McHoul *et al.* 2016).

Organic dairy products represent a significant share of UK dairy markets, and their production is strongly linked to small family farms. The development of organic dairy is linked in part to policy support, but is significant too as a mode of on-farm diversification because organic production provides price premiums. From 2013 to 2014 the organic sector experienced 6.4% value growth compared to a decline of 1.6% in the conventional milk sector (Table 11). This growth equates to £9 million revenue, while the conventional sector had a £40 million loss (OMSCo 2015). Among organic dairy products, the largest is the organic liquid milk category, accounting for around half of all organic dairy demand, followed by yogurt and cheese (OMSCo 2015). The UK dairy organic sector is dominated by private label and branded products. The leading brand, Yeo Valley, recorded a 13.2% increase in sales value, versus 4.5% for private label organic dairy sales (OMSCo 2015).

Table 11. Value and performance of the UK organic dairy sector

	Organic market value	Growth year-on-year (YOY)	Conventional market growth YOY
Milk*	£152m	5.7%	-3.1%
*Milk total	£168m	6.40%	-1.60%
Yoghurts	£142m	14.2%	-2.5%
Cheese	£24m	-2.7%	0.5%

Source: OMSCo (2015)

Although organic represents a key strategy in the UK for dairy farmers to achieve price premiums at a time of depressed milk prices, supply for UK organic milk is currently in balance, and there is little scope for new producers to enter the market (OMSCo 2015). Stakeholder interviews noted the differences in the fortunes of organic and conventional dairy producers but were cautious about organics wider transformative potential due to market balance. As interviewees explained, organic milk producers have experienced low prices for their milk in the past. Currently producers enjoy a good premium because organic milk is balanced and carefully managed by the organic supply chain, as the following quotes explain.

“[In] a crisis situation like this, lots of dairy farmers would have gone to organic from conventional. There are several things stopping them now. One is it takes two years [to convert] and there are no grants to encourage them to do it [...] some of them, a lot of them, can remember, not very long ago, when either themselves or their neighbour or their cousin, converted to organic and then ended up getting a crap ride to organic because it was overdone” (D: Interviewee 8).

“I’m very confident for the future of organic, just because of the way its been regulated, so I’m appreciative of what OMSCo has done and that regulation of contracts has been probably very, very useful for the organic market and finding external markets outside of the UK has also been very important, that seemed to have really helped the price” (D: Interviewee 9).

5.3.6 Voluntary standards and products of origin

Dairy farmers can comply with a series of voluntary international standards. In general, at farm level, the most relevant are:

- HACCP (Hazard Analysis and Critical Control Point): this is a system that helps food business operators look at how they handle food and introduces procedures to make sure the food produced is safe to eat.
- British Global Standards (BRC): this is a safety and quality certification program, used by over 23,000 certificated suppliers in 123 countries, with certification issued through a worldwide network of accredited certification bodies.
- EFSIS Safe & Legal Standard: this is designed for small food manufacturers to provide an all-encompassing food safety audit.

These standards are voluntary, but HACCP is compulsory by definition as it is unlikely that production sites will get authorisation without it. Since 2008, the UK dairy industry has also voluntarily committed to a plan to reduce the environmental footprint of producing liquid milk.

Farmers committed to a range of targets covering renewable energy, efficient water use, carbon foot printing and environmental stewardship (Dairy UK 2013).

More specifically, in the UK dairy sector the most important voluntary standard is the Red Tractor farm assurance scheme. This is a private and voluntary standard developed by the UK dairy industry to ensure benchmark standards of animal welfare and product quality at the farm level. Industry stakeholders involved in the development and management of the scheme are Dairy UK, the NFU, the British Cattle Veterinary Association, the Scottish Board of Dairy UK and the British Retail Consortium. The scheme aims to build the confidence of consumers in dairy products by setting standards for animal health as well as responsible production processes. Farms are inspected every 18 months. The assessors are further verified by random audits. In 2013, the scheme covered 64 milk purchasers and 11,012 milk producers. This corresponds to about 11.1 billion litres of milk produced.

Another important voluntary standard concerns milk transportation. In this respect, the Dairy Transport Assurance Scheme is the UK industry's assurance scheme for milk transport, applied to by 80 to 90% of milk haulage capacity in the UK. The scheme provides assurance to milk purchasers that the transport of fresh milk and milk products meets food safety requirements, industry good practice guidelines and customer needs (Dairy UK 2013). The scheme is based on annual inspections of the milk haulage depots. The assessment is conducted against 56 standards covering haulage operations, vehicle hygiene, site and statutory requirements, HACCP, personnel and training, subcontractors and contingency procedures (Dairy UK 2013).

In addition to voluntary standards, the EU protection of food names legislation on a geographical or traditional recipe basis, introduced in the 1990s, is also of importance. There are three different labels of origin, which provide legal protection against imitation throughout the EU: Protected Designation of Origin (PDO); Protected Geographical Indication (PGI) and the Traditional Specialty Guaranteed (TSG). In the UK there are 17 designated dairy products (11 PDO and 6 PGI) and almost all of them are cheeses. Somerset has one PDO cheese, the "West Country Farmhouse Cheddar", exclusively produced in the counties of Dorset, Somerset, Devon and Cornwall, and one PGI cheese, the "Exmoor Jersey Blue", exclusively produced in West Somerset and parts of the Exmoor National Park.

Standards such as the Red Tractor cover regulatory issues outlined earlier related to animal welfare and health, water cleanliness, etc. They thus play an increasingly important role as a system of private governance. Standards are important also for international trade. Some interviewees noted, for example, that European standards will need to be reached even if the UK is not in the EU: "in order to trade with Europe, we have to meet European Standards whatever happens, so any legislation that's European led we have to abide by, within the sector" (D: Interviewee 1). Interviewees also noted farmer frustrations regarding the paperwork required to comply with standards and duplication between some standards.

5.4 Key issues identified in the literature, media and interviews

5.4.1 SWOT analysis

The analysis of regulatory and market conditions (task 2.2) through literature review, media sources and stakeholder interviews for the dairy farming case study in Somerset has identified a list of key issues that are discussed in this section. Some of the issues are summarised initially through a SWOT analysis (Table 12). The text below discusses some of the issues in more detail. The key issues described will inform future discussions with producers and other supply chain representatives as part of Task 2.3.

Table 12. SWOT analysis – dairy

Strengths <ul style="list-style-type: none">• Good agro-ecological conditions (high quality grass/grazing)• Well established dairy tradition and expertise/knowledge in the county• Key dairy co-operatives and processors in close proximity• Dairy farming is part of the county's identity	Weaknesses <ul style="list-style-type: none">• Price volatility and increased exposure to markets• Poor milk price (for some) does not match cost of production• High input costs• Farm succession & ageing farmer profile• Entry to the industry is difficult due to high costs / land availability• bTB regulations and business impacts
Opportunities <ul style="list-style-type: none">• Attempts to establish new producer organisations (e.g. Dairy Crest Direct)• Greater flexibility with abolition of milk quota• Futures markets for milk/dairy products• Brexit?	Threats <ul style="list-style-type: none">• Continued oversupply of liquid milk• Price volatility and exposure to global milk price markets• Lack of access to milk contracts• Climate change (increased pressures to reduce impact from dairy)• Brexit?

Overall, arguably the most interesting finding to emerge is the relationship between regulation (especially the abolition of milk quota) and markets (in terms of emerging contracts, market-based ways to control supply and demand, the role of standards in terms of quality control and potentially also increasing roles for banking institutes).

Among the **regulatory conditions**, the key issues that emerged are as follows:

1. A **progressive process of deregulation** of the sector in terms of milk quotas and reduced market protection (through the 2013 CAP Reform) is of particular importance, as it triggers regulatory changes affecting production volumes and farm-gate prices. UK production volumes of milk were below the milk quota allocation in recent years, therefore quota abolishment is unlikely to represent a significant direct weakness or threat in the immediate period. However, quota abolition can represent an important indirect threat. Specifically, some interviewees noted that quota in the past was an

asset, including for tenant farmers. This asset now no longer exists. Moreover, with the abolition of milk quota some countries (notably Ireland) have significantly increased their milk production. This creates potential market threats, but milk quota also presents opportunities (e.g. farms can exploit economies of scale by increasing production volumes). How farmers will be affected by the price effect of quota removal will depend on the product they supply, the arrangements within the supply chain and the producers' ability to adapt to market price changes.

2. The **CAP's direct subsidies** still form a substantial part of dairy farms income, about 30%, and are vital for some dairy farms, particularly smaller farms. Brexit may result in a severe reduction of this support, threatening the survival capacity of some farms. However, lower protection can also represent an opportunity to improve the managerial skills of farmers to be more responsive to market signals.
3. **Bovine TB and antibiotic residue regulations** can represent weaknesses for dairy farmers as they can limit the farm's operations. Particularly relevant is bTB regulation which restricts cattle movements, particularly in endemic areas such as the county of Somerset. Regulations on antibiotic residues are more a concern in pig and poultry production, but the dairy sector needs to encourage careful management and health beliefs among farmers and vets. Most dairy contracts and related standards provide specific guidelines on what veterinary medicines are allowable.
4. From the interviews some issues emerged in relation to **tenanted dairy farmers**. For instance, tenancy agreements have user clauses and some may stipulate that the farm must be used as a dairy farm. It was thought unlikely that a landlord would be strict about this if a tenant needed to change to stay in business, although it may be something enforced if the landlord wanted to get rid of the tenant. With the loss of milk quota, cows are now a tenant farmer's main asset.
5. **Brexit** emerged as a major policy shock that brings with it several uncertainties, but its overall effect is highly debated. On the one hand, Brexit represents a threat, especially with respect to the loss of CAP direct subsidies, the loss of access to the EU Single Market and potentially reduced access to a skilled migrant labour force that is vital for the UK dairy industry. On the other hand, Brexit is a potential opportunity to obtain better agricultural and environmental policies targeted specifically to the UK dairy sector and better trade deals with international partners. However, the net effect of Brexit on the UK dairy sector will be unclear until policymakers make decisions on when the UK.

While regulatory issues are important, **market issues** are the most critical. The critical role of market issues was noted at the stakeholder workshop and also dominated interview discussions. There are several aspects linked to markets and their organisation that emerged as key issues in the analysis:

1. The **"milk crisis"** is presenting major threats to UK dairy farmers. The milk crisis was triggered by current low milk prices and, in general, by problems related to milk price volatility. The reasons for low milk prices are global and complex (e.g. lower global demand of milk combined with milk oversupply; the ban of dairy exports to the Russian market) and options to manage this threat is not straightforward. With the current reduction of policy intervention at the EU level, the variability of milk prices has become more evident and the dairy sector now operates in relatively unpredictable international markets. Farmers receive different prices depending on their buyer and product quality. The milk crises led to a number of well publicised farmer protests at leading

supermarkets and processors. The SOS Dairy Campaign argued that the price producers were receiving for their milk was not sufficient to cover production costs. Some interviewees suggested the farmers who benefited from the campaigns were not necessarily the ones most in need.

2. The progressive deregulation of the sector, combined with an increased exposure of farmers to international market volatility, boosted the development and adoption of **production contracts** between producers and supermarkets/processors. There is clear variability in milk price between dairy farmers based on whether farmers are aligned to a supermarket or production contract or not. It is an interesting signal that during the SOS Dairy Campaign farmers on contracts did not protest. The playing field is very uneven, which is a reflection of market conditions. Interviewees suggested some who were part of contracts got lucky, and/or it was down to timing or appropriate geographical location, particularly for some processing contracts. It is not possible at the moment to get new supermarket contracts. They are not available.
3. Another key market arrangement is **A and B pricing**. This is a pricing matrix with a core price and a market realisation price. There is debate about whether A and B pricing is the best way forward, or whether it would be better to just have one price. Some argued that A and B pricing was an attempt by processors to manage supply. It is important to note that the pricing matrix system seems to be a market tool replacing quotas. Farmers are discouraged to produce above the A price level with price B often below production costs, creating de facto a system that voluntarily limits the production volumes to a market equilibrium level. These market arrangements are more flexible than the quota system, as contracts and pricing matrices can be negotiated every year and are largely dependent on the local availability of supermarkets or processors willing to engage in a contract with farmers.
4. New **partnerships and Producer Organisations** (POs) represent further opportunities to manage the current market challenges, and they are also supported by the EU's Milk Package. The idea is that POs would give producers greater power in terms of negotiating contracts. There is limited uptake of this activity in England and Somerset particularly. The reason is partly because of a general culture of non-co-operation among farmers but the scheme is also rather cumbersome (at least as implemented by Defra). There is currently one PO set up in Somerset: Dairy Crest Direct (which has recently split into two POs). Stakeholders recognised the need for greater co-operation to sell milk, including also joint ventures at farm level (to share capital, expertise, etc.).
5. Further opportunities for the dairy sector come from **organic milk**. Similar to supermarket-aligned conventional dairy farmers, the price for organic milk is currently good. The situation was different a few years ago and some organic milk producers exited and returned to conventional production. This is not the case now. However, the market is clearly defined. Volumes are defined by OMSCo, for example. There are opportunities for some new producers to enter organic markets, but this is sometimes dependent on location (e.g. close to / within catchment for a major organic processor, such as Yeo Valley). There are some opportunities also to develop markets for grass-based milk (i.e. less intensive but conventional).
6. In order to differentiate products, the role of **quality standards** is also very important. Red Tractor is the baseline quality standard for UK dairy. Quality standards cover a lot of the regulatory issues related to animal welfare and health, water cleanliness, etc.

Some interviewees noted farmer frustrations regarding the paperwork required to comply with standards and the duplication of standards.

Finally, in addition to regulatory and market issues, during the analyses some key **finance and social issues** also emerged:

1. Finance issues are mainly related to **access to credit and assets**. There are significant differences between owner occupier dairy farmers and tenanted farmers. Credit access is a strength for owner farmers, as for them access to finance is relatively easy because the farmhouse and land can be used as security assets against borrowed capital. On the contrary, access to finance is a threat for tenanted dairy farms.
2. Social issues are mainly related to **succession, exit strategies and new entrants**. Succession emerged as an important issue in the stakeholder interviews and the roundtable workshop and it has been described as a difficult, emotive and persistent issue facing the sector. Dairy farmers are exiting the sector; however, interestingly, not all exit because they are bankrupt or due to a lack of successor – some exit because they realise there is better money to be made doing something else (i.e. exiting is the smart strategy) or they are not willing to do the work required for the level of reward. That said, some farmers are ‘locked in’ because of heavy capital investment or because they do not have high loans and are able to ride out the storm. Joint ventures, partnerships and matching schemes are opportunities to encourage new entrants.

5.5 Dairy supply chain arrangements: focus groups, additional stakeholder interviews and participatory workshop

This section reports on the findings of three focus groups with dairy farmers, 11 additional stakeholder interviews and one participatory workshop that were conducted as part of task 2.3, with the intention of complementing and building on the findings of task 2.2.

A series of *three focus groups* were held with Somerset/north Devon dairy farmers in March 2017. Details of the numbers of farmers involved in each case and a brief synopsis of their socio-economic data are given in appendix 8. The main purpose of conducting these focus groups was to complement and build on the analysis of regulatory and market conditions reported above under sections 5.1-5.4, in order to provide an insight into the perspective of the farmers themselves. As per the fishers’ case study, although the focus groups were composed of individual farmers, analysis of the data is intended to elicit understanding of the wider dairy sector within Somerset/north Devon, rather than simply of individual farmers.

Each of the focus groups lasted approximately 1.5 hours and was digitally recorded for later verbatim transcription. In terms of their individual comments, anonymity was promised to the participants. As such, any direct quotations that are used in this report refer simply to the relevant focus group, rather than to any individual farmers. The focus group schedule was divided into seven different sections, details of which are given in appendix 9.

Data from the focus groups was rich and insightful, but attendance at two of the three focus groups was lower than expected, due to dairy farmers very busy work schedules. To complement the focus group data, it was decided to carry out a further series of *supply chain interviews*,

especially with representatives of the dairy supply chain. Consequently, 11 interviews were conducted, mostly with dairy processors, farmer co-operative representatives or individuals who were in some way involved in buying milk from dairy farmers and/or helping to set up milk contract arrangements (see appendix 10). This proved to be a hugely informative exercise, deepening the analysis and understanding of different institutional arrangements available to dairy farmers. The interviews typically lasted one hour, but some lasted longer. All were recorded and transcribed. The interviews have been coded so as to anonymise the identity of the interviewee. A copy of the interview schedule is provided in appendix 11.

The *workshop* was conducted in May 2017, following reflection on the focus group and interview data. The aims were similar to inshore fisheries workshop. In other words, to firstly present the key findings of the research conducted so far as part of task 2.2 and 2.3 to a range of stakeholders from the dairy industry and to get their feedback and comments on it. The findings from the focus groups and interviews were reported under seven key areas (see below), which were then presented to those at the workshop for feedback and comments. The presentation was structured so that it was possible to allow the participants to make comments at any point. This led to a very participatory and interactive meeting. As per the fisheries case study, the workshop comments are reported as part of the focus groups data under section 5.5, below.

Dairy workshop 30th May 2017



The second aim of the workshop was to discuss a range of scenarios regarding the future viability of dairy farming in Somerset, linked to the Brexit negotiations. This part of the workshop significantly informs work that will be conducted under WP4 in terms of developing solutions and scenarios more generally. Data from this part of the workshop is reported as a distinctive section from the other workshop and focus group data (section 5.6), including further details about how the scenarios were constructed and analysed by participants.

The workshop lasted for four hours and was digitally recorded and transcribed, which resulted in a 106-page transcript of the discussion. The agenda for the workshop is available in appendix 12, with the research findings presented before lunch and scenario work after lunch. There were a total of 14 people at the workshop, four of whom were part of the research team. The 10

stakeholder participants included key voices from the industry, including dairy processors (organic and conventional), farmer union representatives, key advisors/analysts from the dairy advisory board, a young farmers' representative and an academic who specialises in dairy farming and food chain management. Details of those who attended are given in appendix 13. As with the focus groups and interviews, anonymity was promised to the participants. Consequently, for anonymity purposes, any direct quotations used in this report are given a number (e.g. DWSP 1, where WSP means 'dairy workshop participant').

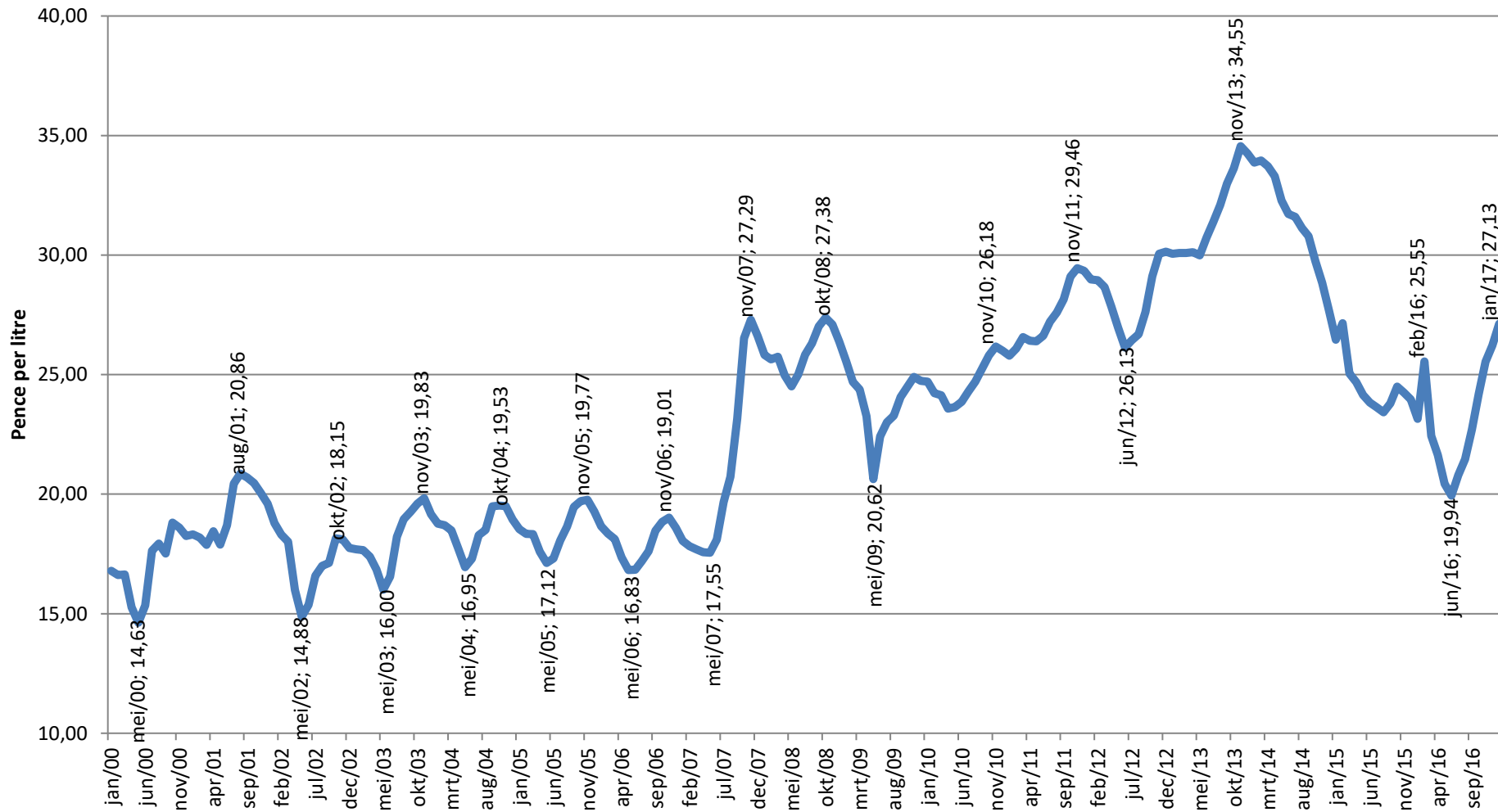
Analysis of the interview and focus group data revealed that there were seven key areas that required further examination, and these structure this and the subsequent section of the dairy report. The seven key areas are as follows:

- Milk price and price volatility
- Institutional arrangements for milk
- Contractualisation and pricing instruments
- Collective action (DPO and co-operative models)
- Market data and futures
- The future (succession and social drivers)
- Brexit

5.5.1 Milk price and price volatility

Although price volatility has been a consistent characteristic of the dairy industry over many years, it has intensified in recent years. Price variability was largely associated with the seasons (lowest during the 'spring flush' and highest in the winter months); however, more recently, it has been less associated with a seasonal pattern and is more sporadic (see Figure 30; see also Section 5.3.3). As noted in previous sections, this notable volatility has been the source of significant discontent amongst dairy farmers and has mobilized high profile protests and a wealth of media coverage.

Figure 30. Farm gate milk prices, 2000-2016



Source: Data – AHDB (<https://dairy.ahdb.org.uk/market-information/milk-prices-contracts/farmgate-prices/uk,-gb-and-ni-farmgate-prices/#.WbvhEMYo9pg> accessed 15.09.17)

The issue of milk price volatility was recognized throughout the interviews and focus groups as a key characteristic of the dairy industry. However, there were numerous suggestions that volatility was intensifying; resulting in more dramatic highs and lows, as well as also becoming more frequent.

“If you go over 12 years, you’ll see the peak and trough gradually gets bigger and bigger each time and they get closer together each time. Whereas 15 years ago, it was quite a steady flow” (Sedgemoor Focus Group).

Participants had some clear ideas about what caused milk price volatility. With reference to the low farm gate price in mid-2016, participants described the price as ‘lousy’ and ‘inadequate’ and price volatility was a divisive topic across all participant profiles. One interviewee, representing the Arla farmer co-operative, identified three key factors in the recent price crash – all three factors compounded to mean there was a **surplus of milk** on the global market:

- Firstly, China and Russia – “two of the big buyers of global dairy products stepped out of the market”
- Secondly, a good production year around the world meant “we all produced a shed load of milk”
- Thirdly, as from 1st April 2015, milk quotas were abolished. “All my European colleagues who were being constrained by milk quotas suddenly had the opportunity to turn the taps on because they’d been held back for years, they’d had this shed full of cows waiting and off they went, regardless of pricing because they were fed up of being constrained” (D: interviewee 16).

Participants understood milk price volatility as the product of global issues, rather than an isolated national problem. As the Arla interviewee explained further:

“We are not isolated in milk anymore... So now you’ve got a situation where the market is quite fragile, and suddenly all this milk comes running forth out of Europe. Is it any surprise that the price bombed?” (D: Interviewee 16).

The impact of overproduction is particularly evident within the organic sector, where, as above, government conversion schemes caused an increase in organic milk production, unwarranted and poorly matched by demand.

“[It did have a bit of a crisis, was that in 2008?] It was. [Yes. So what happened?] Over-supply [Okay] Linked to government grants. The supply exceeded demand (D: interviewee 21b).

“It was over-supplied and there were people converting or expanding their herds, who didn’t notify anybody, and then they’d ring up and say, ‘are you going to buy my milk? We’ve converted, we’re ... and suddenly there was a whole extra amount that came on board and because OMSCo didn’t want to discourage people, and we agreed we would buy it, it had to be at a reduced price” (Sedgemore Focus Group).

In the conventional milk market, price was largely understood to be the biggest determinant of production levels, i.e. farmers increased production in response to higher prices.

“Since the price rising in November last year, we’ve seen significant increases in the milk volume, as a result of just putting the price up [...] a lot of consultants are saying, you know, ‘yes, you’re getting a bit more money, but don’t go mad and produce all this milk, we’ll be in the same situation again, so pay your bills, reign it in, but don’t get excited and go mad” (D: interviewee 19)

Participants agreed that issues of oversupply and undersupply were the cause of market volatility and there was a clear sense that producers needed to be far more sensitive to the market in order to maintain a stable milk price. Increasing sensitivity, and mechanisms such as A&B pricing, according to one interviewee (D15), was what “partly drove the recovery in milk prices in 2016”, which the respondent asserted was supply driven, and not demand driven. As he put it:

“The recovery we’ve seen in milk prices in the last, you know, seven or eight months, has been supply driven, not demand driven [...] Demand is still pretty soft, globally, and in the UK, but supply has been really weak and so that’s what causes it. So the danger with it is, and that’s one of the things we talked to our farmers about last week, at our farmer days, we mustn’t let history repeat itself again and just, as an industry, go charging off into producing lots of extra milk, now that we’ve got a higher milk price, only to crash the market and that’s true both on a national level and just on a Crediton Dairy level” (D: interviewee 15).

The terms ‘accommodation milk’ and ‘milk washing’ (i.e. oversupply) emerged in the Sedgemoor Focus Groups as a cause of milk price volatility. One focus group participant attributed this to a government intervention:

“I’m going to be quite blunt and say I think it was caused by Defra, AHDB [Agriculture and Horticulture Development] (Dairy), RABDF [Royal Association of British Dairy Farmers] ... I don’t know what they called it, they launched something at the dairy event, was it three or four years ago, it was when quotas were coming off, they said there’d be fantastic exports and all the rest of it, and they talked up the industry [...] this is *absolutely* true, so it led people to be over-producing and the processing wasn’t there and then of course all the supermarkets can play the tune” (Sedgemoor Focus Group).

This claim was met with some resistance in the focus group. For example, one participant suggested that “...the underlying thing was [farmers] wouldn’t have over-produced if the price hadn’t been there” (Sedgemoor Focus Group). In contrast, members of the Coombe Focus Group suggested dairy farmers, especially in the organic sector, tended to be quite sensitive to market demands.

“They understand the ethos of what’s going on [...] just by whacking on a load more cows doesn’t necessarily mean you’re going to get any more money” (Coombe Focus Group).

Price wars between supermarkets, started initially by Iceland were also blamed for triggering price lows. The idea that one supermarket could cause such a knock on effect is testament to their levels of power over the dairy industry. As one focus group participant explained:

“Iceland started it. Iceland were the culprits that started it. They don’t sell much milk ... or they didn’t at the time, so they decided to drop their price as a loss leader, to get people in, and then Aldi and Lidl [...] then dropped their price. And as soon as they did that, I think Asda were the next ones, Tesco [So you get a price war kicking off?] So then you get the price war kicking off. It hasn’t recovered from that really” (Sedgemoor Focus Group).

5.5.2 Institutional arrangements for milk

The analysis identified a number of different institutional arrangements for selling milk. These different arrangements represent different options or strategies that at least have the potential to help dairy farmers manage market volatility, although as explained below some arrangements have been in place for some time so it is more about the strategies developing within these supply chain arrangements (e.g. new pricing mechanisms, contracts) that represents the response to volatility. The following discussion, based on analysis of the interview and focus group data, outlines the key institutional arrangements identified, and their associated characteristics. The different arrangements confer their own advantages and disadvantages. As one respondent put it, “there are lots of different arrangements ... and none of them wrong. They’re just different” (D: interviewee 19). In general terms, it is possible to distinguish between collective and individual arrangements. Examples of each are now described in turn.

1. Collective organisational sales

- (i) Co-operatives (e.g. Arla, OMSCo, First Milk)
- (ii) DPO (Dairy Crest Direct)

2. Individual sales

- (i) Supermarket aligned contracts (account for 10% of sales)
- (ii) Direct to processor/milk buyer (e.g. Muller non-aligned, Crediton Dairies, Barber’s, Wykes)
- (iii) Informal arrangements (direct to the consumer)

5.5.2.1 Collective organizational sales

(i) Co-operatives

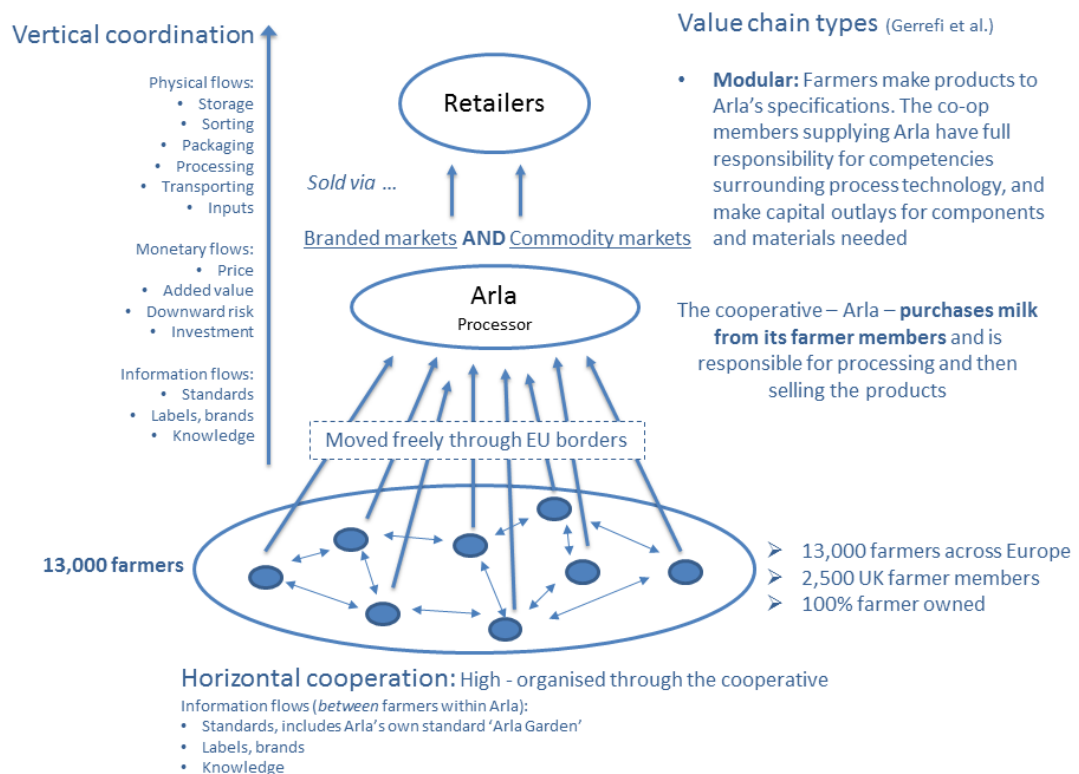
Cooperatives such as Arla and OMSCo, purchase milk from farmer members and are subsequently responsible for processing and then selling the products. The milk is covered by an obligation to deliver arising from the farmer’s membership of the cooperative in accordance with the conditions set out by the cooperative.

Arla

Arla is a European dairy cooperative with around 13,000 farmer members across Denmark, Sweden, Germany, UK, the Netherlands and Belgium (see Figure 31). It has an annual turnover of around £9 billion, and trades predominantly in Europe. It is 100 per cent owned by farmers. The Arla group originally established over 100 years ago, although it has evolved significantly over this period, involving the merger of various cooperatives. Most notably, in 2012, Milk Link and its circa. 1000 members was dissolved into Arla to bring the total number of UK farmers in

the cooperative to 2,500. Milk collected from farmer members is taken to one of their processing sites throughout Europe, where it is processed and sold. Money is pooled and redistributed through the monthly milk price. As a respondent from Arla explained, “that’s the point about the co-op, there’s nowhere else for the money to go. Ultimately it finds its way back to the farmers”. Arla has begun to recognise the opportunity for business growth in areas such as China, the Middle East and North Africa. As a European cooperative the ‘Arla model’ relies heavily on milk and associated products moving freely across European boundaries. For instance, Lurpak is made in Denmark before being imported into the UK and so the group currently takes advantage of the free movement of goods in the Single Market.

Figure 31. Arla institutional arrangements



Farmers buy into the cooperative, and receive a monthly milk price, plus an appropriation (also termed ‘the 13th payment’). A further sum – a consolidation or reinvestment figure – gets paid back to reinvest in the businesses. Arla can only be funded by farmers and no one else can take a profit share out of the cooperative. This exclusivity is “fundamental because [...] the difficulty is whenever you introduce another equity partner into a co-op. They usually have a diametric, opposite requirement to the farmer, in the sense that they need to minimize the milk price to reach the profit” (D: interviewee 16).

Arla offer **evergreen unlimited contracts**. For the Arla representative and some focus group participants this was important. For example:

“That’s one of the virtues of Arla over most of the other processors, is my contract with Arla is evergreen, so they can’t get rid of me, and in the current downturn, or rather the recent downturn, the benefit of that has come to light where some of the smaller processors have actually shoved farmers out the door because they couldn’t cope. And

another virtue of the Arla contract is that they will buy all my milk without restrictions, so I can go on expanding and they have guaranteed to buy all my milk on the same price, now that's not widespread in the industry [...] they'll buy all that milk at the same contractual terms as they buy everything else" (D: interviewee 16).

"We could go and take on another 400 cow farm tomorrow, and ring up Arla and say 'right, we're going to put another million litres on our contract', they're quite good like that" (Young Farmers Focus Group).

Whilst unrestricted contracts have been criticised by some for lacking sensitivity to the market and allowing dairy farmers to freely overproduce, Arla claim their pricing mechanism is sufficient to discourage overproducing. The following quotes capture this.

"I mean we've had a slight price cut, to various howls of anguish around the industry, but the accompanying narrative with the price cut is 'listen guys, the market is topping out [...] we are getting a bit of a correction, just hold your horses" (D: interviewee 16).

"The Arla theory is, because we are like 25 per cent of UK producers, for everyone that goes up within Arla, there will be another one that will drop out" (Sedgemoor Focus Group) i.e. it balances out because the cooperative is large enough.

Arla described themselves as a strong cooperative, with significant bargaining power. They attribute this leverage to three factors: (i) scale, (ii) the ability to export, and (iii) branding.

"Scale helps a little bit but more important than scale, there are two leverage tools for us. One is get it out of the country, so export, tighten the supply. And the other is branding i.e. they have to come to us to buy the product, they can't get it from anyone else [...] so we are the biggest milk buyer in the UK. In terms of branding, Lurpak, Cravendale, increasingly the Arla brand, Costello Cheese which is a smaller brand, Anchor, those are all our brands ... now the point is, Lurpak, the biggest selling butter - £300 million of sales annually, Tesco's can only come to Arla for Lurpak, so we've got the leverage" (D: interviewee 16).

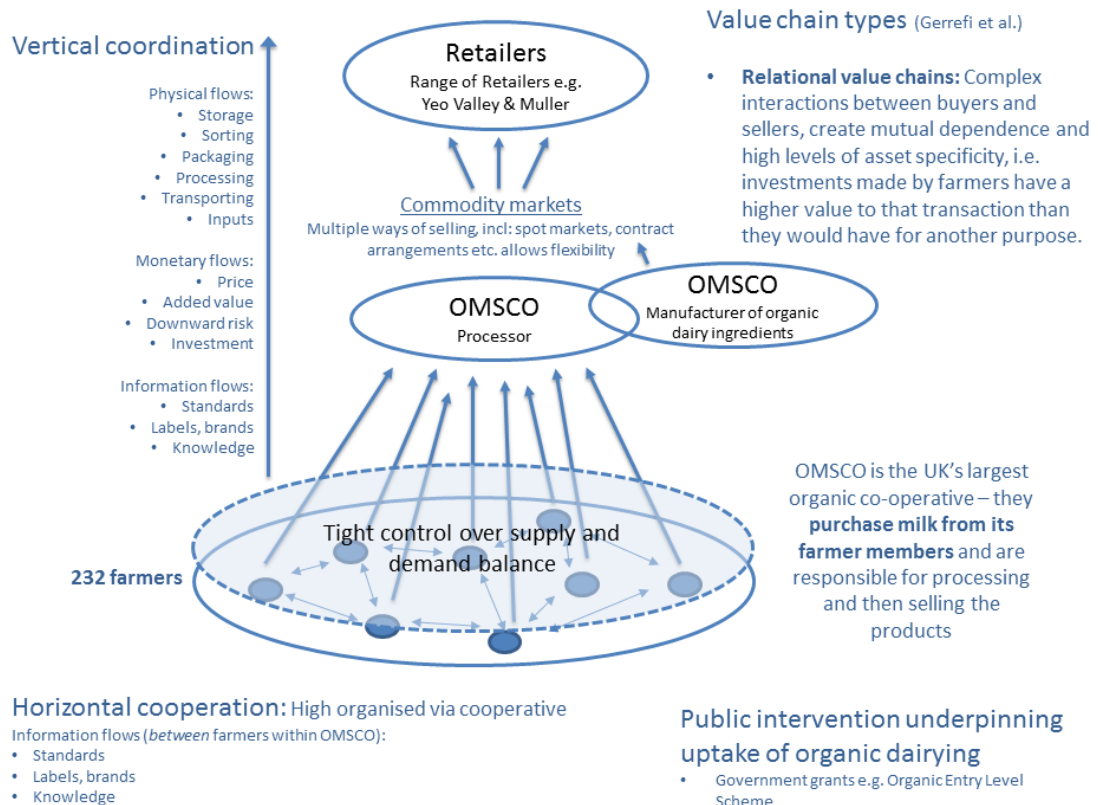
As the largest UK cooperative, Arla thus described themselves as having the ability to 'keep the market straight', because as long as they are recruiting farmer members, other buyers cannot afford to be too far out of line. To avoid exposure to volatility, Arla supply milk via both **commodity** and **branded markets**, with branded market prices tending to be much more stable than pure commodity prices. As the representative from Arla explained, "it's important for a farmer to look at the product mix of the business he's supplying because that will have a bearing on the volatility or the level of volatility he's going to be subject to going forward" (D: interviewee 16).

OMSCo

OMSCo is the **largest organic milk cooperative** in the UK. Their central role is "to operate on behalf of members to secure milk fields on their behalf, whether they are going into liquid milk fields, or ingredients areas" (D: interviewee 21b). Critically, like Arla, they **purchase the milk** and **manage it all the way through** to the retailer (see Figure 32). OMSCo currently has 232 members but is expanding its membership and is soon to have in excess of 250 members across the UK,

owing to opportunities in global markets such as America, Australasia and China. OMSCo “manage everything relating to the farmers and milk supply and endeavor to give them opportunities to enhance their businesses and returns.” (D: interviewee 21a). Organic dairy farmers who are accepted to joined pay a one-off joining fee to become full members.

Figure 32. OMSCo institutional arrangements



OMSCo **market the milk in a number of different ways** depending on what is appropriate for the milk. These range from long-term contracts for liquid milk, to spot markets for dairy ingredients. Although they market milk in a range of different ways and to a range of buyers (ranging from larger buyers such as Yeo Valley and Muller, to numerous smaller buyers), OMSCo, unlike Arla, **sell only to commodity markets**. Whilst Arla view the mix of selling to branded and commodity markets as important to achieve stability, OMSCo claim that not having specific brands gives them ‘more flexibility’ as to where they put the milk. As one representative from OMSCo explained, “if you’re tied into a brand, then obviously it’s a tighter net that you’re sort of filling” (D: interviewee 21b).

The milk price for OMSCo members is set out on the 1st April every year. Purchasing is based on a seasonality profile, so farmers are paid three months of the year on a flat fee, whilst the remaining months depend on how much milk is produced in the spring. This mechanism aims to prevent a ‘spring flush’ – i.e. is designed to ensure a stable production system. The price received by OMSCo farmers over the last 3 years has been very stable and increased last year. It has consistently **succeeded the conventional milk price** by in excess of 16p per litre. The stability of OMSCo’s milk price is the product of careful monitoring of supply and demand.

“We are very carefully monitoring the people who wish to convert and ensuring that we only take on anybody where we have a home for that milk, so basic criteria.

Everything we do is about maintaining a supply and demand balance” (D: interviewee 21a).

“The organic sector has shown that the milk industry can remain a lot more stable if we monitor it and the industry has learnt from previous episodes where there has been increases in supply, that don’t match demand” (D: interviewee 21b).

The efforts to monitor demand and subsequently control supply are central to OMSCO’s success (both in terms of the price and the stability of the price). Whilst there are lessons the conventional market could learn from this, it is important to note that organic milk makes up just 3 per cent of the dairy market. Such tight monitoring of demand and control of supply are harder – if not impossible – in the conventional market.

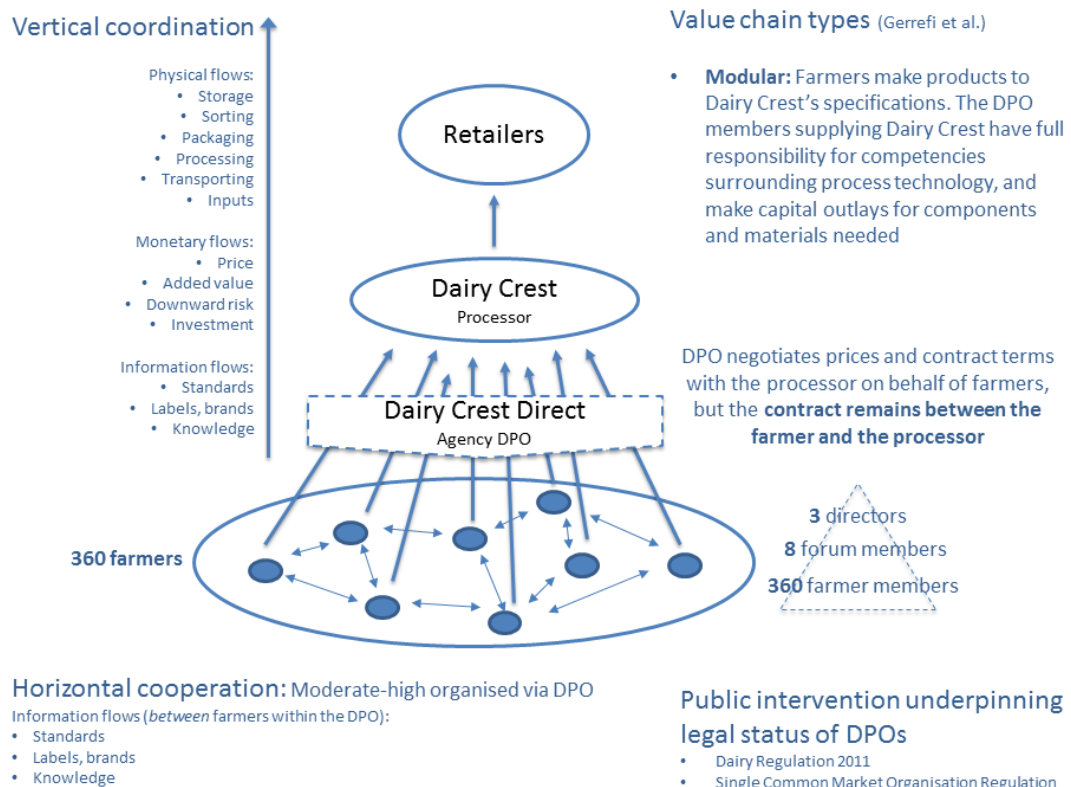
(ii) Dairy Producer Organisation (DPO)

Dairy Crest Direct

Dairy Crest Direct (DCD) is an agency DPO, which is formed to collectively negotiate terms (both with reference to prices and contract terms) with the processor, or in some cases, the retailer, on behalf of its members (Figure 33). The actual milk contract remains between the individual farmer and the processor. As the DCD representative put it,

“We [Dairy Crest Direct] act on behalf of our members, but each member holds a contract with Dairy Crest to supply milk. They have a contract with us and a contract with Dairy Crest, but their milk supply contract is with Dairy Crest” (D: interviewee 19).

Figure 33. Dairy Crest Direct (DPO) institutional arrangements



The DCD DPO evolved from a larger DPO which at the time represented 1,020 farmers supplying 1.5 billion litres per annum to Dairy Crest in December 2015, which formed after the sale of the Dairy Crest's dairies business to Muller. DCD DPO continues to represent farmers in the south west who supply their milk into Dairy Crest's Davidstow Creamery in North Cornwall. DCD members transferring from Dairy Crest to Muller were subsequently established to represent DCD members who transferred out of DCD to Muller. The DCD DPO currently represents 360 farmer members; it has eight elected geographically specific Forum Members and three Elected Directors. This highly formalised governance arrangement is characteristic of the DPO model, which some interviewees argued may not appeal to smaller groups or those where a strong supplier-buyer relationship already exists.

The DCD DPO essentially formalised a structure that already existed.

"It legalised what we already doing. We were meeting and negotiating milk prices with Dairy Crest on a regular basis and developing contract options and representing our farmers in those contexts [...] so it allowed us to formalise and become the correct legal entity to do what we were doing" (D: interviewee 19).

An agency DPO, such as Dairy Crest Direct, aims to represent the best interests of its farmer members.

"It gives the farmer some confidence that his milk supply, or his agreement with his milk purchaser is being fully represented by the people who have only got his interest at heart" (D: interviewee 19).

For example, following Dairy Crest's implementation of the voluntary "Code of Good Practice" in 2012, Dairy Crest DPO "negotiated with Dairy Crest to adapt the voluntary code to make some changes to it that we felt made it more beneficial to our members" (D: interviewee 19).

According to DCD (2015: 1), DPO status "provides competition compliant authority and the bargaining strength to constituted farmers' groups to negotiate contract terms and milk prices with their buyer on their members' behalf". The DCD Chairman described the DPO as providing "legitimacy, accountability and rigour" which helps "future proof effective farmer representation in a fast evolving marketplace". Farming Minister George Eustice congratulated Dairy Crest Direct on forming the first DPO in the UK and anticipated that the DCD, supported by a £110,000 grant from Defra's Dairy Fund, would mean farmers had "greater power to negotiate the price of their milk and give themselves more clout in the market place".

Processors, such as Dairy Crest, benefit from the formalisation of the relationships/communication between themselves and their producers. "It provides them with a point of contact for them to discuss and consider ideas for the future" (D: interviewee 19). Although the benefits of the DPO were cited amongst those in the industry, with specific reference to the DCD DPO, there was some caution noted by interviewees and focus group participants in terms of viewing the DPO structure as a 'silver bullet'. As the DCD DPO representative put it, "it's the relationship [with the buyer] that's relevant [...] it's not the DPO that delivered [...] it's been a long period of working with the milk buyer that does it" (D: interviewee 19).

Inherent to their relationship with Dairy Crest, was their negotiation of a contract that was introduced in April 2016. The DCD interviewee described the innovative contract type established by the DPO as “loosely A and B”. As part of this, every farmer has a monthly core volume they can produce at a monthly-negotiated price. Where it differs to a standard A and B contract, is that if the group as a whole produce less than what Dairy Crest needs, farmers producing more than their core volume will be paid the set price for their ‘surplus’. If the DCD farmers produce more than what, as a whole, Dairy Crest need in that month –otherwise known as their ‘collective core allocation’ – the set price is only received for their core volume, with surplus litres being paid on a transparent market price; the market price has the potential to be higher than the core set price, although although it was noted that this had not yet been the case. The contract in place means all milk produced by DCD farmers is guaranteed to be purchased by Dairy Crest. However, if Dairy Crest obtain more milk than they need from DPO members that month, surplus litres will be sold on an open market basis. DCD DPO members are not penalised for under production.

DCD refer to the contract as a supply management risk contract which sought to address the problem of oversupply and the resulting price volatility. They hoped it would protect farmers who provided the right amount of milk from price decreases caused by oversupply.

“We had Dairy Crest on the one hand saying, if you keep supplying more and more milk, we don’t know what we are going to do with it, and we wanted to ensure that those farmers that didn’t keep supplying more milk weren’t losing out to the same level as others that were causing the problem” (D: interviewee 19).

In addition to agency DPOs, which act on behalf of members in price negotiations, two further types of DPO exist.

- *DPOs acting as an agency contracting with processors on behalf of its members:* In practice, this means the PO contracts directly with one or more processors on behalf of its members, but like an agency acting on behalf of its members in price negotiations, it does not take ownership of the milk. Members of this kind of PO will have a legally binding agreement with the PO that commits them to supply their milk to whomever the PO has a contract with.
- *DPOs acting as a principal taking ownership of the milk:* The PO takes ownership of the milk buying it from members and selling it onto one or more processors; effectively the DPO acts as a milk broker on behalf of its members. This option will require that the PO is responsible for milk logistics, quality, administration (including liaison with the RPA) and milk balancing.

5.5.2.2 Individual sales

Individual sales refer to various arrangements.

(i) Supermarket-aligned contracts

Although supermarket-aligned contracts they represent a relatively small proportion of the milk buying market – accounting for around 10 per cent – they are an important arrangement. Examples include Tesco Sustainable Dairy Group (TSDG), which is supplied via Muller (see Figure 34). Retailer-aligned contracts emerged as a response to the negative PR supermarkets received

about the prices they were paying to dairy farmers, and out of a desire on the part of the supermarkets to secure milk supply.

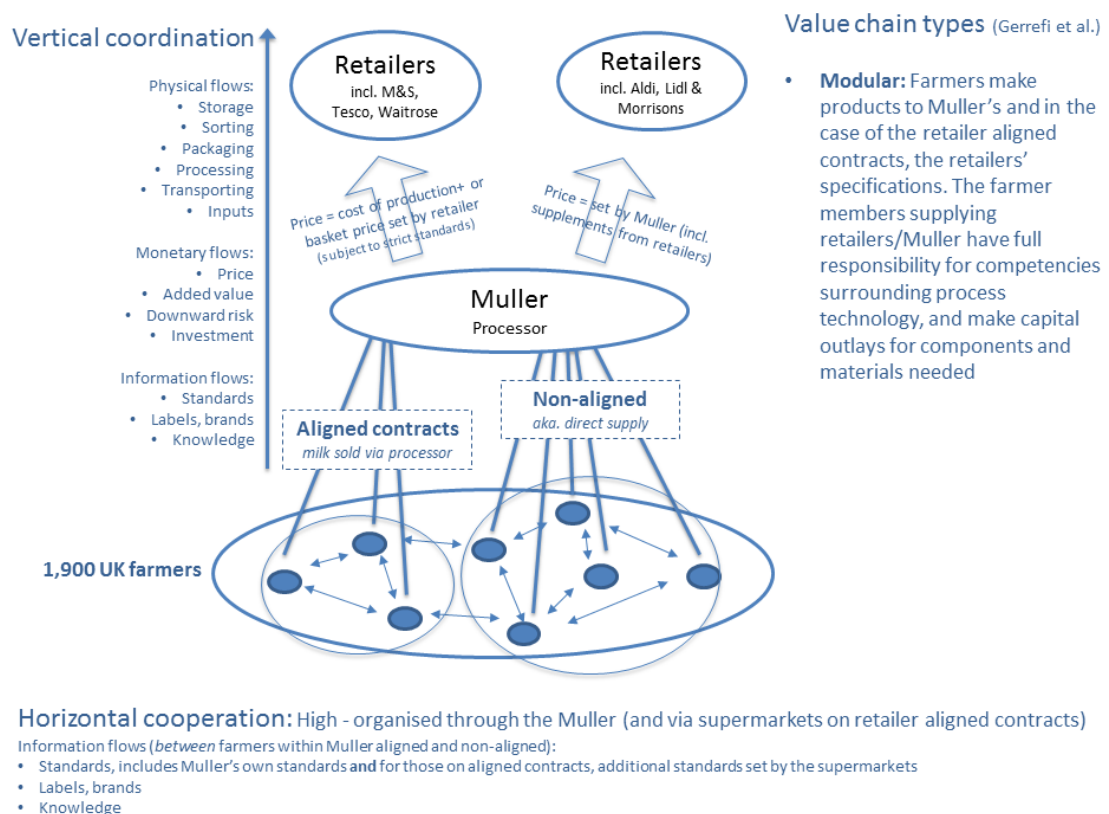
“They wanted to ring fence a group of producers that they knew they could look after a bit better and guarantee future supplies” (D: interviewee 16).

In retailer-aligned contracts, farmers sell their milk, via a processor, to a supermarket retailer such as Tesco or Sainsbury’s. The price they receive covers the cost of production and includes a premium. It protects farmers from market volatility and prices are set in advance to ensure a stable income for dairy farmers.

“The only guys that are isolated [from price volatility] are the guys that have retailer aligned contracts... So they’ve been doing OK throughout this ... kind of haloed ground [...] if you are on them, they are fantastic [...] when we were getting 18/19 pence, they were still getting 29 pence” (D: interviewee 16).

“If you can get on them and you can stay on them you are on to a winner aren’t you” (Young Farmers Focus Group).

Figure 34. Supermarket aligned and non-aligned institutional arrangements



(ii) Direct processor/milk buyer

Farmers selling their milk direct to the processor or milk buyer are also a key individual sales arrangement. In the Somerset and North Devon case study examples included arrangements with large processors, such as Muller (direct supply contracts), to arrangements with smaller dairies / specialist cheesemakers, such as Barbers, Crediton Dairies and Wykes.

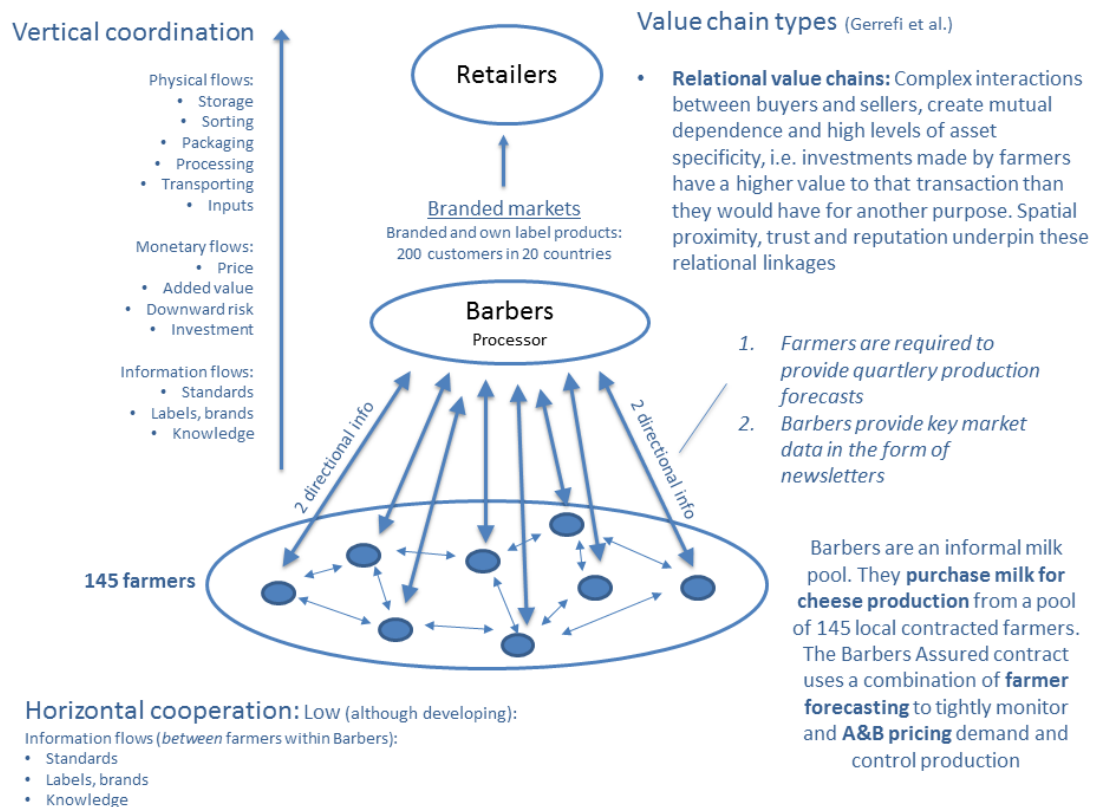
Muller non-aligned contracts

Farmers on Muller non-aligned contracts – also known as direct supply contracts – supply milk to Lidl, Morrisons and Aldi, as well as schools, hospitals, corner shops and retail chains such as Starbucks. Muller non-aligned contracts run alongside supermarket aligned contracts (see Figure 28). They differ to aligned contracts in that the price is set by Muller, although many retailers supplement the prices received by farmers, in response to negative PR (D: interviewee 18).

The Barber's Assured agreement

Barbers –one of the world's oldest cheddar makers –has established a **milk pool** that purchases milk from 145 farmers across Somerset and Dorset. It supplies milk for over 100 different branded and own label farmhouse cheeses (see Figure 35). The cheeses have Protected Designation of Origin (PDO) status. Barbers supply 200 customers across 20 countries. They have recently launched a new transparent milk contract. The "Barber's Assured" agreement is voluntary code compliant, and encourages farmer forecasting and introduces a base milk volume for 2017, with an 8 per cent added threshold for producers, based on volumes set in December 2016.

Figure 35. Barbers' institutional arrangements



The contract, which utilizes an A and B pricing mechanism, claims to be more market sensitive and transparent. It requires farmers to supply Barbers with a forecast, four times a year, to enable them to understand what volumes of milk they will need to sell. The introduction of the new contract formed a response to overproduction and a move towards monitoring of demand and control over supply:

“Just over a year ago, Barbers were getting so much milk they didn’t know what to do, they had no method of control at all, so they had two choices, they either had to take the price down on every litre, which they did [...] they also served notice on farmers because it got that severe, so it was a very salutary lesson and they wanted to do something that was different from that” (D: interviewee 22).

The arrangement ensures stability for Barber’s as a business, as well as their farmers, as overproduction only impacts on those who have exceeded their base volume, rather than the whole milk pool.

Central to the way in which Barber’s milk pool operates is an exchange of information between the supplier (the farmer) and the processor (Barber’s). As above, as part of the contract, farmers are required to supply Barber’s with a production forecast, four times a year, to enable them to understand what volumes of milk they will need to sell. Equally, farmers receive key market information from Barber’s enabling them to make informed decisions about their production levels.

“I want farmers to start looking at markets closer than they’ve done before. Because they are affected by them and if more farmers looked at markets it would help them make more informed decisions about where they take their businesses... I want our farmers to become match fit with this sort of stuff, and the AMPE stuff and forecasting” (D: interviewee 22).

The milk pool has undergone significant changes in 2017; farmers in the milk pool have “gone from a position where they’ve had discretionary advice, very simple contract, no requirement for any particular standards, no volume management at all” (D: interviewee 22) to a strict contractual arrangement. Although at present, horizontal cooperation – i.e. cooperation between farmers within the Barber’s milk pool – is low, they aspire to drive this forward in the future, as the interviewee explained.

“I want to get this producer group established, get them to fall on their feet a bit, and to start working together, to start to provide some value. They need to be able to provide some value to Barber’s as well, and we’d like to encourage them to be part of that. We’ll have the reviews at the end of the year for how the base milk volume grows and progress and I want to involve them in that process, how that process is worked and managed” (D: interviewee 22).

Although Barber’s currently lacks the formal arrangements compared to being a DPO, it is nonetheless moving towards a more formal representation of its farmers, akin to a DPO model.

“[Barber’s wouldn’t do a DPO-type arrangement, for example?] We can’t think about DPOs, that’s a long way off ... you need the building blocks I feel for putting together the building blocks in five years’ time” (D: interviewee 22).

“It would be a long way off [...] what you’ll notice here that within Barber’s Assured there’s a requirement for us to have a representational group [...] you’ll see, going through that [Barber’s Assured] contract, I’ve actually got the authority of the group actually enshrined in the contract. I know what value it can bring, so what I’m doing at the moment is I’m

asking the farmers themselves how they want their elections to take place” (D: interviewee 22).

Crediton Dairies

Crediton Dairies is a small, relatively informal milk pool, compared to the DPO model, for example. The site itself is 70 years old and was previously part of Express Dairies, and subsequently Northern Foods, before returning to Express Dairies and then Milk Link (a farmers’ co-operative). The dairy continued running under Milk Link until its merger with Arla (October 2012). Arla already had a similar UHT facility, which led to the management buyout of Crediton Dairy in August 2013. In October 2013 it became a standalone site, although in its infancy it relied on an agreement with Arla to supply milk until they were fully established. Now Crediton have acquired their own pool of local farmers (within a 20-mile radius). As well as being local, farmers are only recruited if they are able to provide a level supply (i.e. no spring bias).

Crediton Dairies work closely with a number of relatively small dairy farms (as opposed to a fewer number of large suppliers) to reduce risk; as the interviewee explained they did not want to be reliant on a big farmer that could pull the plug and leave them with a “bloody big problem!” (D: interviewee 15).

As they have established themselves and the availability of milk has grown rapidly, they have adopted an A&B pricing system to avoid problems of oversupply in the future.

“Our milk volumes were growing rapidly and whilst it wasn’t a problem, we could envisage it becoming a problem, if milk volumes carried on growing unfettered at the sort of level that they were going at and so that’s why we took the view to introduce A&B” (D: interviewee 15).

Effectively Crediton Dairies saw their role as a DPO but without the formal status of a DPO.

“I mean I would say that we act as a DPO without having the formal rules of a DPO behind us” (D: interviewee 15).

They had a general preference for a more informal and local approach.

“We consulted with people in the group as to whether they wanted [some] sort of elected representation to elect somebody and so on, but the feedback was that it’s such a small group, and if any of them have a major issue, they can pick the phone up to me, or the phone up to our MD, my boss, and just get the issue addressed and sorted sort of thing [...] Alongside that, we have what we call our farmer days at a local pub, where they basically come for the best part of the day, they sort of come from 11 until 3, and as part of that, we update them on what we’re doing, what’s happening in the market place, what are we doing as a business to drive innovation ...” (D: interviewee 15).

Wykes Farms

Wykes Farms is one of the **UK’s largest family run cheese producers and milk processors**. They have a milk pool comprising 116 farms within a 40-50-mile radius, from their base in Bruton, Somerset. The majority of the 13,000 tonnes of cheese made annually, is sold to supermarkets, with about 15 per cent exported to 160 different countries worldwide.

Wykes place significant **emphasis on the quality of milk produced** and reward their farmers for high quality produce. There is no cap on total fats and proteins and farmers can earn more from increasing these elements. They see this as the ‘unique selling point’ of their milk contract, encouraging innovation and competition.

Similar to Credition, they described themselves as an ‘**informal DPO**’, and did not feel the need to formalise this arrangement.

“I think if you’re looking after your farmers and you’ve got representation from your farmers, there’s no real need for them [DPO], to be honest, and that’s what Muller has done. We have a farmer committee which consists of 9 farmers. We’ve got a chairman and 8 members. So they are the voice of our farmers. We meet on a monthly basis. We go through like a business review of what our business is doing, you know, where we’re up to with our customers, we’re quite open with them, you know, and we discuss milk price and any other issues that they have really, any other contractual issues” (D: interviewee 23).

Wykes pride themselves on a strong but ad hoc relationship with their suppliers. Wykes recognised that dairy farmers were particularly vulnerable to price volatility because of the changing price of the end product. Prices received by farmers can change at any point depending on the price of cheese. Going forward, Wykes are putting an increasing emphasis on their export market.

5.5.2.3 Revaluing milk: Free Range Dairy Network

Unlike free range eggs, which are well-established in the UK market, free range milk is a relatively new and contested concept. However, free range milk and the associated movement is becoming increasingly popular in the UK. In contrast to laying hens, there are currently no EU laws governing free range dairy farming. The Free Range Dairy Network has established what it describes as a “simple set of standards for producers” (D: interviewee 23) enabling them to “provide consumers with a clear assurance that they are buying milk from cows that enjoy the freedom to graze” (<http://www.freerangedairy.org/>; accessed 14.09.17). Producers conforming to the standards – which includes committing to grazing their cows for at least six months of the year (180 days) – are able to utilize the Pasture Promise label (Figure 36).

Figure 36. Free Range Dairy ‘Pasture Promise’ logo



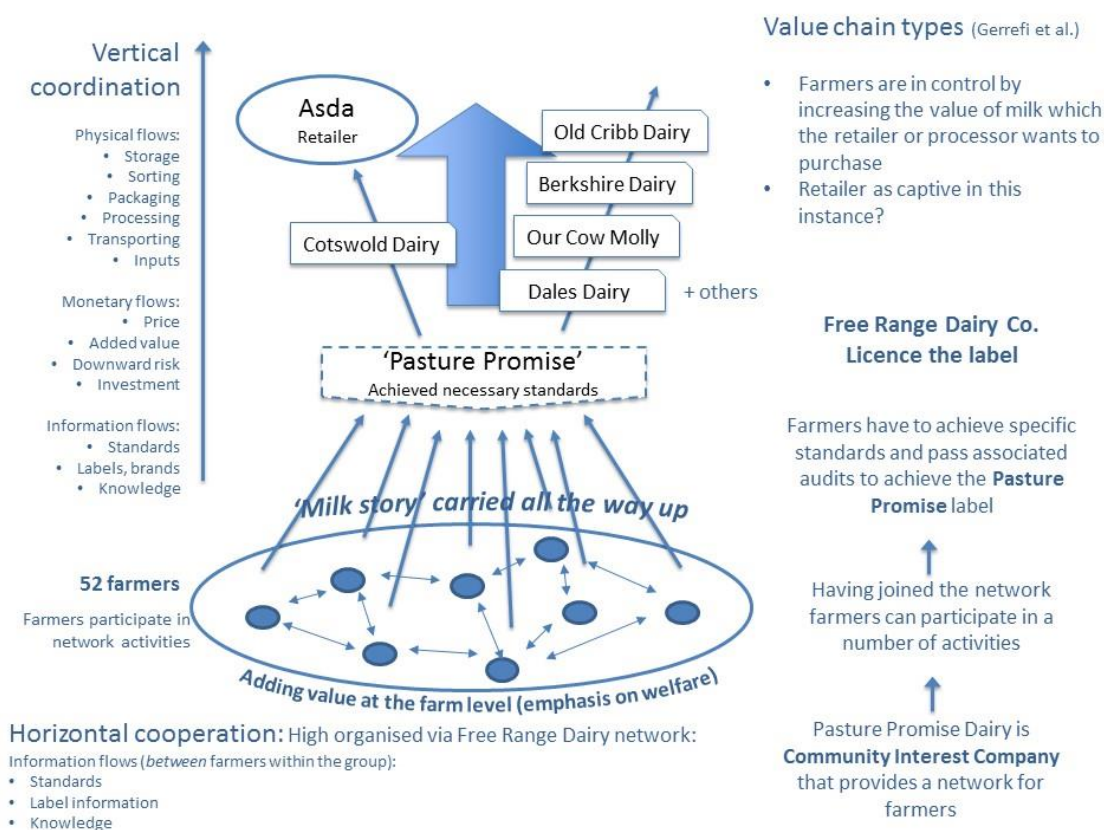
Source: Free Range Dairy (online)

The label is used by members to demonstrate their commitment to keep their cows out in fields. As the Free Range Dairy Network manager explained:

“Well it is that commitment to cows going outside [...] if you’re going to start to call it free range, the cows really need to be out for at least half the year, so 180 is about the 6 month mark and that’s where it came from, it was no more scientific than that really (D: interviewee 23).

Ultimately the concept of Free Range Dairy is a way of increasing the value of the product at the farm level, regardless of how it is sold going forward. It represents a strategy of **adding value to the milk** and **increasing the potential return to the farmer** *before* it is purchased from the farmer. The Free Range Dairy initiative was formally registered as a Community Interest Company (CIC), under the name of the Free Range Dairy Network, in July 2014.

Figure 37. Free Range Dairy institutional arrangement



Free Range Milk is sold through different retail channels and farmers producing milk with the Pasture Promise label are selling their milk to different dairies (see Figure 37). Significantly, large retailer Asda started stocking the free range milk (processed by Cotteswold Dairy) in 109 of their stores in March 2017 and have recently announced they will soon stock it in 367 of their stores, including those in Wales and Scotland, in the coming months. This access into Asda stores has been transformative for the network.

“Asda launching on March 1st has transported us to a different place, you know, we are now becoming very widely recognised” (D: interviewee 23).

In this sense, FRD and the FRD network **institutional arrangement** spans different retailers and contracts, in order to add value to milk.

Free Range Dairy and the Pasture Promise label aim to maximise the amount of time cows spend outside each year; during the spring and summer months, free range dairy cows are free to roam pastures throughout the day and night. Generally, in the winter months, cows are housed inside, fed on grass conserved as silage and hay, although in some areas cows continue to spend winter outside. The Free Range Dairy Network aims to “win recognition for the farming system, not for a milk brand, but for a farming system, so I seek to define recognition for a farming system, centred around this commitment to grazing cows in fields” (D: interviewee 23). Integral to this is the desire to reduce the ‘distance’ between the producer and consumer and “[to] encapsulate the values of cows in fields” into the product.

“What we’re trying to do is actually return people, the consumer to thinking about, actually the real value in my milk lies in the farm, you know, the way the cows are treated, the rural fabric of the communities it comes from, and all those things, and by doing that, I believe we can restore bargaining power, if you like, to the final producer and that’s exactly what this is all about at the end of the day” (D: interviewee 23).

Like the organic movement, the Free Range Dairy Network is acutely aware of the importance of matching supply to demand. “I get farmers who grumble to me that ‘I graze for 150 days, why can’t I join your club?’ but I don’t want every man and his dog doing free range milk because we’ll be in oversupply” (D: interviewee 23).

Despite its obvious rise to success, free range milk was a contentious topic throughout the interviews and focus groups. It is heralded by supporters as a means of adding value at the farm level, rather than simply waving the ‘white stuff’ off to an “increasingly convoluted supply chain” (D: interviewee 23).

Although the manager of Free Range Dairy Network confidently described the free range milk concept as an important revolution revaluing milk, it was subject to notable criticism during the interviews/focus groups. Specifically, participants were skeptical and ambivalent about the meaning behind ‘free range’. They were particularly concerned that the definition of free range and the welfare standards associated with the term were being falsely interpreted by members of the public. They also noted that there were welfare issues with cows being out all of the time, which they feared the public may not understand. As one focus group participant explained:

“I’m mixed about it a little bit because well we tick that box quite well [...] but the biggest welfare thing with the cattle, like the guys that have got the cows in all year round, it may not be what the consumer thinks they are buying, but a lot of them, they are the most well looked after, probably the happiest cows really, is the irony, and perhaps some of the grazing systems when they are out all year round, in the middle of winter, when they are in mud up to their bellies [...] there’s welfare issues there, so there’s welfare issues whichever way, there’s welfare issues in any system, any system done well works really well. I like to see cows out to grass, and I think the consumer does” (Sedgemoor Focus Group).

Those in the organic sector considered free range as an imitation of organic systems without the need to adhere to the same level of standards.

“You might have heard all this nonsense at the moment about this free range milk? [...] We’ve been doing free range milk for an awful long time, it’s called organic! And the difference between free range and us is that ours is actually audited to a standard, whereas I think, you know, you could basically have what you like, and as long as your cows are out in a field, you can call yourself free range. Not sure there’s any auditing goes on, whereas ours are very stringent” (D: interviewee 14).

It was suggested too that the consumer was not to blame for the interest in free range dairy products and that it was confusing from their perspective. Similarly, there was concern in the focus groups that the free range movement was causing the public to think non-free range products experienced a lower standard of welfare.

“I’m not a big fan of free range dairy to be honest [...] I think it’s similar to what happened with the chickens really, people think ‘oh yes, that’s free range, so the other stuff’s not free range, and it creates a negative image I think about farms” (Young Farmers Focus Group).

5.5.2.4 Understanding dairy farmers' institutional arrangements – a summary of key issues

Guiding question		
1. Can you please explain where and how (channels) you commercialise your products?	<p>Dairy farmers sell their milk in a number of ways.</p> <ol style="list-style-type: none"> 1. Collective organisational sales <ol style="list-style-type: none"> (i) Co-operatives (Arla, First Milk, OMSCo) (ii) DPO (Dairy Crest Direct) 2. Individual (direct) sales <ol style="list-style-type: none"> (i) Supermarket aligned contracts (account for 10% of sales) (ii) Direct to processor/milk buyer (Muller non-aligned, Crediton Dairies, Barber's, Wykes) (iii) Informal arrangements (direct to the consumer) 	Markets and marketing
2. What are the main challenges you have with your customers and the demand for your commodities?	<p>Public perception of dairy plays a significant role in customer's interest in/desire to purchase milk. The industry has recently come under scrutiny in the news and social media for its treatment of cows and calves. This negative press has led to increasing demand for milk from the small/local/family farm, as opposed to the big or factory farm (even though there is little suggestion that small/local/family farms have higher welfare standards etc. and that, although important to public perception, this notion is relatively meaningless).</p>	
3. What marketing strategies do you have in order to secure better deals?	<p>For farmers who have secure contracts, marketing strategies are of less importance to their sales. However, in some cases, such as those selling milk on a more informal basis (either where milk being sold is in addition to milk sold elsewhere or their primary mode of sales) marketing was regarded as vital. These farmers are increasingly required to be more entrepreneurial to firstly, add value to the milk they produce, and secondly, to promote it (taking to the internet and social media for example).</p> <p>In response to their perceived ill-treatment of farmers, many of the big supermarkets have adopted a 'milk story' to connect consumers with where their milk comes from.</p>	
4. Is certification part of your strategy?	<p>Standards/certification was seen as integral to dairy farmers. Red Tractor is the minimum industry standard and all dairy farmers interviewed had this as a minimum. Very few contractual arrangements identified require only Red Tractor alone. Depending on the intended destination of the milk, additional criteria are imposed.</p> <p>Standards serve two key purposes in the dairy industry. Firstly, they act to protect the brands and businesses they are associated with, and secondly, they are key to the appeal of UK milk and milk products.</p> <p>Although certification was universally important for members of the industry, it was particularly integral to those selling organic or Free Range Milk. In these cases, the unique selling point of the milk is only evident with achievement of the organic or Pasture Promise certification.</p>	

5. Has there been any recent contextual change that has influenced your current business model?	The dairy industry has suffered significant milk price volatility since 2007. This volatility has prompted a number of different business models/strategies to ensure continued survival. These include strategies to add value to milk at the farm level (either by increasing the nutrient content of milk or through a 'milk story' e.g. Free Range Dairy). Other strategies have included selling milk directly on the farm (e.g. the Horrington Milk Hut), hedging the price of a set amount of milk for a number of months to guarantee prices (one dairy, Yew Tree, allows their farmers to do this and Muller have also recently introduced it for one of their manufacturing contracts) and finding alternative buyers. At the industry level, the establishment of Dairy Producer Organisations such as Dairy Crest Direct, aim to represent the best interests of its farmer members and organise collective action in the negotiation of prices (as well as contract terms). In addition, dairy farmers are beginning to engage with price information and forecasts to guide their business plans. It is anticipated that the outcome of the Brexit negotiations could have a significant influence on dairy farmers' business strategies – particularly for those farmers supplying to Arla and Muller.	
6. How do you finance your activities, and what would you require to change this?	All of the participating dairy farmers were well-established and did not identify borrowing money for their business as an issue at the time. However, the issue of finance, specifically the capital required for new entrants to establish themselves in dairy farming, was a key industry issue that emerged in all interviews and focus groups. In addition, there was some concern that uncertainty relating to Brexit was likely to limit bank lending further, particularly for new customers. Intergenerational farm transfer remained the dominant mode of entry into dairy farming, although there were exceptions such as herd managers who had no familial connection to the industry.	Financing
7. Do you work with other dairy farmers? How did this start? How is it going? Will you continue in the future?	Farmers talked of significant interaction with other farmers, both through formal and informal channels. Horizontal coordination – particularly in the form of knowledge exchange (events, discussion groups, meetings etc.) – was common amongst collective and individual sales arrangements. The Free Range Dairy Network is a particularly good example of horizontal coordination; farmers pay a membership fee and have access to a series of network events and activities. In the past farmers have perhaps been disinclined to work with other farmers (valuing their autonomy), but the recent market volatility has encouraged farmers to work together to identify best practice etc. to improve their resilience in a difficult economic context.	Horizontal coordination
8. Do you collaborate with others in the value-chain? How did this evolve? Will you continue with this in the future?	Producers are increasingly having to engage with other members of the value chain. This is in part a response to the market volatility and represents a response to find new ways to work. It is particularly common amongst more informal and individual sales arrangements such as the Free Range Dairy Network and amongst the smaller milk pools. Increasingly, farmers are required to communicate and engage more and more with processors through forecasting. In some cases, e.g. Barber's contract, information flow between the producer and processor is two-directional, with processors communicating market information to farmers and farmers contracted to supply accurate forecasts. To avoid issues of oversupply (a significant factor in the price volatility), communication and	Vertical cooperation

	collaboration between producers and processors is likely to continue in the future and is likely to be increasingly formalised, i.e. stipulated in producer contracts.	
9. Do you feel that the current policy context helps you to improve your business performance?	Farmers expressed mixed feelings about the usefulness of the current policy context. Whilst farmers felt subsidy was not well targeted (and was the route of many of the industry's issues, e.g. inflated land prices), they equally expressed concern about the potential lack of subsidy post-Brexit. Farmers generally felt policy could be improved by being targeted to the specific needs of the UK in the form of the British Agricultural Policy. It was anticipated that a more targeted policy and support provision would encourage a more efficient and productive industry.	Policy and regulations
10. What environmental constraints and social challenges do you need to address?	<p>Dairy farms located within Nitrate Vulnerable Zones (NVZ) face significant constraints regarding allowable nitrate levels and slurry storage times. These constraints have resulted in significant investment costs for some farmers. There are also environmental constraints relating to water quality that are also impacting on dairy farmers' activities. More broadly, there are concerns over the general environmental impact of dairy farming which are likely to constrain certain activities as the industry faces the need to sustainably intensify.</p> <p>A key social challenge for the dairy industry was the issue of the availability of new entrants and their ease of access to the industry (primarily because of the costs involved – this links to the SFP inflating and sustaining land prices). It was recognised that entry to the industry was typically through intergenerational farm transfer and that it was very difficult, if not impossible, for new entrants to establish themselves in the industry. It is anticipated that the reduction or redistribution of agricultural support, post-Brexit will reduce land prices and make this easier for new entrants. Although a reduction in the value of the land may prove problematic for incumbent farmers who have borrowed money against the current value of their land.</p>	
11. How do you deal with current policies and regulations? What are your main strategies?	<p>A key strategy (for some dairy farmers at least) in response to the dissatisfaction with current policies and regulations was to vote for Brexit in the hope that a more targeted British Agricultural Policy would ensue. Nevertheless, there is significant concern amongst farmers and those associated with the industry, that agriculture and particularly dairy, will not be given adequate consideration in Brexit negotiations.</p> <p>More generally, dairy farmers are seeking a diverse range of ways to sell their milk and dairy products. Where they are dissatisfied or struggling, they are seeking alternatives. They are increasingly required to be entrepreneurial – seeking new ways of adding value to their products. They are also finding (some degree of) solace amongst groups of other farmers, whether that is via large collective organisations such as Arla, or smaller and more independent networks such as the Free Range Dairy Network. The legal status of Dairy Producer Organisations (DPOs) also represents a strategy which farmers are deploying to deal with the current political and economic context.</p>	

<p>12. What is the impact of your farming activities on the sustainability of the dairy sector; furthermore, how would you define this impact?</p>	<p>The diversity of institutional arrangements in place are intended to ensure the financial sustainability of the sector, i.e. secure the best price for the milk produced. The different arrangements to some degree offer farmers alternative ways of securing a better (or at least adequate) milk price. Farming activities such as Free Range Dairy (which stipulate cows have to be outside for 180 days a year, as a minimum) are potentially increasing the financial sustainability of the dairy sector by enable farmers to add value to their products at the farm level, and thus having some control over the prices they receive. Although these strategies represent definite efforts to improve the sustainability of the sector, milk price is still volatile and in recent periods have failed to cover the cost of production. This has prompted protests and social media.</p>	<p>Financial Sustainability</p>
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5.5.3 Contractualisation and pricing instruments

Table 13 outlines the characteristics of the different contractual arrangements observed, including:

- Pricing determination
- Length of contract in years
- Cancellation/notice period
- Quantity to supply buyer
- Exclusivity
- Price change notice period

The contract information presented is true of July 2017.

We now explore participants' understandings of the different pricing mechanisms identified, including their relative advantages and disadvantages.

Table 13. Comparing contracts

	Contract stipulations					
	Price determination	Length in years	Cancellation period	Quantity to supply buyer	Exclusivity	Price change notice
1. Collective organizational sales						
a. Co-operatives						
Arla	<ul style="list-style-type: none"> Formulaic and basket prices 	<ul style="list-style-type: none"> Evergreen 	<ul style="list-style-type: none"> Recent proposal to extend notice to 12 months 	<ul style="list-style-type: none"> Unlimited volumes (farmers can add on more litres at the same price) 	<ul style="list-style-type: none"> Largely exclusive (can sell up to 10% via other means) 	<ul style="list-style-type: none"> Price changes can be a min. of a week
OMSCO	<ul style="list-style-type: none"> Milk price set on 1st April every year Farmers are paid 3 months of the year on a flat fee. Remaining months depend on how much milk produced in spring 	<ul style="list-style-type: none"> Long term contracts 	<ul style="list-style-type: none"> 12 months 	<ul style="list-style-type: none"> Closely monitored 	<ul style="list-style-type: none"> Exclusive 	<ul style="list-style-type: none"> Declare price on an annual basis
b. DPO						
Dairy Crest Supply Management Risk Contract	<ul style="list-style-type: none"> Core paid at negotiated price Adapted A&B: if whole group is under that month, those producing over will get paid A price 	<ul style="list-style-type: none"> Evergreen (although Dairy Crest reserve the right to apply 12 months notice to supplier) 	<ul style="list-style-type: none"> Standard 12 months either side Can be reduced to 3 months in special circumstances 	<ul style="list-style-type: none"> Buy all milk produced but above core volume paid spot market price Quarterly forecasting for next 12 months 	<ul style="list-style-type: none"> Exclusive 	<ul style="list-style-type: none"> At least 30 days advance notice of any reduction

	Contract stipulations					
	Price determination	Length in years	Cancellation/notice period	Quantity to supply buyer	Exclusivity	Price change notice
2. Individual sales						
a. Supermarket-aligned						
TSDG	<ul style="list-style-type: none"> Cost of production+ Strict additional quality stipulations to receive price 	<ul style="list-style-type: none"> Evergreen 	<ul style="list-style-type: none"> As per Muller or Arla (processor) standard conditions 	<ul style="list-style-type: none"> Agreed sum allocation, surplus paid via Arla or Muller standard pricing 	<ul style="list-style-type: none"> Exclusive 	<ul style="list-style-type: none"> TSDG provide at least 30 days notice of price change Surplus litres change to standard notice periods
b. Direct to processor/milk buyer						
Muller non-aligned	<ul style="list-style-type: none"> Basket price (using five prices from different processors in the market)? In the future, ingredients customers can hedge/sell forward a proportion of their milk 	<ul style="list-style-type: none"> Evergreen 	<ul style="list-style-type: none"> 12 months notice to farmers 3 months notice to Muller following milk price change 	<ul style="list-style-type: none"> Requirement to inform and seek approval from Muller if the farmer intends to expand by more than 10% in a milk year 	<ul style="list-style-type: none"> Exclusive 	<ul style="list-style-type: none"> 30 days notice for price increases or decreases May apply changes mid-month
Crediton	<ul style="list-style-type: none"> Base price with bonuses and deductions relating to quality criteria A&B pricing – B receives AMPE price 	<ul style="list-style-type: none"> Evergreen 	<ul style="list-style-type: none"> 12 months either side for cancellation 	<ul style="list-style-type: none"> 2015 production volume + 1.5% 	<ul style="list-style-type: none"> Exclusive 	<ul style="list-style-type: none"> 30 days notice

Barber's	<ul style="list-style-type: none"> • Composition (protein & butterfat) determines 95% of price • Prices determined by forecasting + 8% • A&B mechanism: anything above forecast receives AMPE-2 	<ul style="list-style-type: none"> • Evergreen 	<ul style="list-style-type: none"> • 12 months note given to farmers • 6 months notice to Barber's • 3 months notice to Barber's within 30 days of a price decrease 	<ul style="list-style-type: none"> • Forecasting required (+8% allowed) • No penalties for over supply, yet 	<ul style="list-style-type: none"> • Exclusive 	<ul style="list-style-type: none"> • One month's notice on price changes
Wykes	<ul style="list-style-type: none"> • Paid on the compositional quality of the milk • No cap on total fats and proteins and can earn more from this 	<ul style="list-style-type: none"> • Evergreen 	<ul style="list-style-type: none"> • 12 months note given to farmers • 6 months notice to Wyke's • 	<ul style="list-style-type: none"> • No restrictions 	<ul style="list-style-type: none"> • Exclusive 	<ul style="list-style-type: none"> • Can change at any time up to month in which price applies
Coombe	<ul style="list-style-type: none"> • Cost of production + i.e. prove price is as low as possible • Pay more for winter milk • 	<ul style="list-style-type: none"> • Evergreen 	<ul style="list-style-type: none"> • 12 months 	<ul style="list-style-type: none"> • Quarterly reviews 	<ul style="list-style-type: none"> • Exclusive 	<ul style="list-style-type: none"> • Provide up to 30 days notice in consultation with Waitrose
c. Informal arrangements						
Davis and Parsons	<ul style="list-style-type: none"> • Basket of prices from four other processors (incl. Muller and Arla + 2 'high-end manufacturing contracts from milkprices.com) 	<ul style="list-style-type: none"> • 12 months 	<ul style="list-style-type: none"> • No data 	<ul style="list-style-type: none"> • Unlimited and keen for more milk from their farmers 	<ul style="list-style-type: none"> • Not exclusive 	<ul style="list-style-type: none"> • Basket price reviewed monthly

5.5.3.1 Price determination

Summary of mechanisms:

- A&B pricing
- 'Cost of Production, plus'
- Hedging/futures market pricing
- Formulaic pricing
- Basket pricing

A&B pricing

As depicted in the description of institutional arrangements, Barber's have adopted an A&B pricing mechanism to tightly control supply in line with market demand. The contract, which utilises an A&B pricing mechanism, claims to be more market sensitive and transparent. It requires farmers to supply Barber's with a forecast, four times a year, to enable them to understand what volumes of milk they will need to sell. The introduction of the new contract formed a response to overproduction and a move towards monitoring of demand and control over supply:

"Just over a year ago, Barbers were getting so much milk they didn't know what to do, they had no method of control at all, so they had two choices, they either had to take the price down on ever litre, which they did [...] they also served notice on farmers because it got that severe, so it was a very salutary lesson and they wanted to do something that was different from that" (D: interviewee 22).

Larger companies such as Arla and Muller have not needed to adopt such mechanisms, because of their global connections and ability to 'ship things around':

"Muller is international, so we can ship things around, import and export, and we have that power to do that [...] we [Muller] can just say, 'right, we'll just dry it', we've got a drier in Severnside, put it into skimmed milk powder, so there are a lot more places that we can send the milk ... more capacity" (D: interviewee 18)

A&B pricing mechanisms were described as a processor level replacement for government-imposed quotas.

"As the government restrictions have been taken away, so processors have needed to step into that gap, which is entirely appropriate, you know, it's important that you know quotas were a very blunt instrument for restricting production, much better that production is regulated at the processor level" (D: interviewee 15)

Whilst A&B pricing mechanisms are regarded as a useful tool by many in efforts to keep supply and demand tightly controlled, there are nonetheless negative connotations of the term.

"A&B pricing had a bit of a bad reputation because some of it was brought in without any discussion with producers and this was brought in overnight and there was no transparency" (Sedgemoor Focus Group).

"My concern with them is a lot of the processors use them as a smoke and mirrors tool to reduce the price they pay to farmers because they make them hideously complicated and

the framers, you just can't see through them. In theory they're good tools. In practice, I'm worried about the smoke and mirrors ..." (D: interviewee 16)

Rather than A&B, Arla suggested their pricing mechanism gives a far clearer signal to producers to slow production. Although Arla guarantee to purchase all their famers' milk on the same price and contractual terms, without restrictions, price signals limit overproduction and encourage production in times of undersupply.

However, those on A&B contracts (or similar arrangements) questioned the morality of unlimited contracts when overproduction has been largely to blame for poor prices in the recent past. Aside from pricing mechanisms, Muller highlighted the importance of farmers' levels of understanding of the relationship between demand, supply and market price to keeping the milk price stable. This raises questions about the scope/potential for educating/training farmers on this aspect of their business.

Cost of production plus

In 'cost of production plus' the farmer receives a price for their product that covers cost of production as a minimum, plus a bit more, ensuring sustainable profitability of their business. For example:

"Cost of production type contracts have proven their worth where there are strong working relationships and trust along the supply chain and as such have many benefits. For raw material buyers, cost of production type contracts can help develop better relationships with suppliers, aids control over product quality standards and can improve the ability to plan ahead. Paying a price that covers production costs helps demonstrate good corporate responsibility to consumers" (ADAS, <http://www.adas.uk/News/delivering-producer-and-buyer-benefits-with-cost-of-production-contracts>; accessed: 15.09.2016)

The disadvantages of 'cost of production' contracts are largely felt by the buyer:

- The buyer takes on the risk and typically means paying more than their competitors for milk, e.g. Tesco claim to have paid £240 million over market prices to their milk farmers since 2007
- Developing dynamic and fair cost evaluation systems is highly time consuming for buyers

The exceptionality of aligned contracts was widely recognised amongst participants. One processor explained hwo they initially emerged as follows:

"[Supermarket X] started their dairy development group, and they spoke to the local people, local advisors, in the area, and said 'right, what farms do you think would be good for this plan, and if those farms had really good quality, good attitude, good welfare, you know, ticked the box, then they were offered the contract in the area [...] but since then, there is a lot of farmers outside of those contracts that are bloody good farms, really good welfare and really on it, and they are desperate for a supermarket contract, but there isn't any" (D: interviewee 18).

5.5.4 Collective action (DPO and co-operative models)

Although intended to give farmers greater power to negotiate milk prices and give them more influence in the market place, DPOs were widely criticised by many interview participants. Criticisms came from (1) those involved in less formalised milk pools and (2) farmer cooperative members.

Those involved in less formalised milk pools, such as Crediton and Wykes, felt they had many of the same beneficial structures in place without the added complication of having to formalise the DPO structure (see section 5.5.2.1 (i) above). Whilst less formal milk pools rejected the level of formalisation required to become a DPO, the cooperative criticism of DPOs was more cutting. Arla, for example, was concerned DPOs did not have any leverage over the price the processor is offering.

“I can’t get my head around them because I can’t see where the leverage is and no one’s ever been able to tell me where the leverage is. They are a common negotiation body so they might represent all the dairy producers in Dairy Crest, but where does the leverage lie? What tools have they got if they don’t like the price that their processor sets for them because that’s how it works with Dairy Crest ... you know they tell the farmers effectively what they’re paying ... what tool have they got at that point ... the only tool that they’ve got is to pick the milk up and take it elsewhere ... well on those volumes of milk, you can’t do that ... you can’t pick up all of Muller’s milk supply and go out to the market and say ‘does anyone want 2 million litres of milk please?’” (D: interviewee 16).

Similarly, OMSCo felt without purchasing the milk from farmers, agency DPOs were powerless as a negotiating body, particularly at times of over-supply.

Discussion of the merits of DPOs in the Sedgemoor Focus Group suggested that they were “the next best thing to a coop”. As one farmer put it, “you can’t [as a DPO] beat the market but you can operate the best you can and jointly work together rather than in an adversarial way” (Sedgemoor Focus Group).

There was also some suggestion that the work done by the DPO structure is underestimated.

“The PO we have, so we have a forum which is 60 farmers roughly, one forum person and then seven, as it is now it’s just seven forum guys, three directors, and a company secretary, so to speak, who is a non-farmer [...] so they have all had negotiation training [...] actually they do hell of a lot of research about market backgrounds and whatever ... sort of extending the negotiation processes to try and hammer out the best deal [...] and then they come back and the farmer says ‘that’s still a rubbish price’” (Sedgemoor Focus Group).

5.5.5 Market data and futures

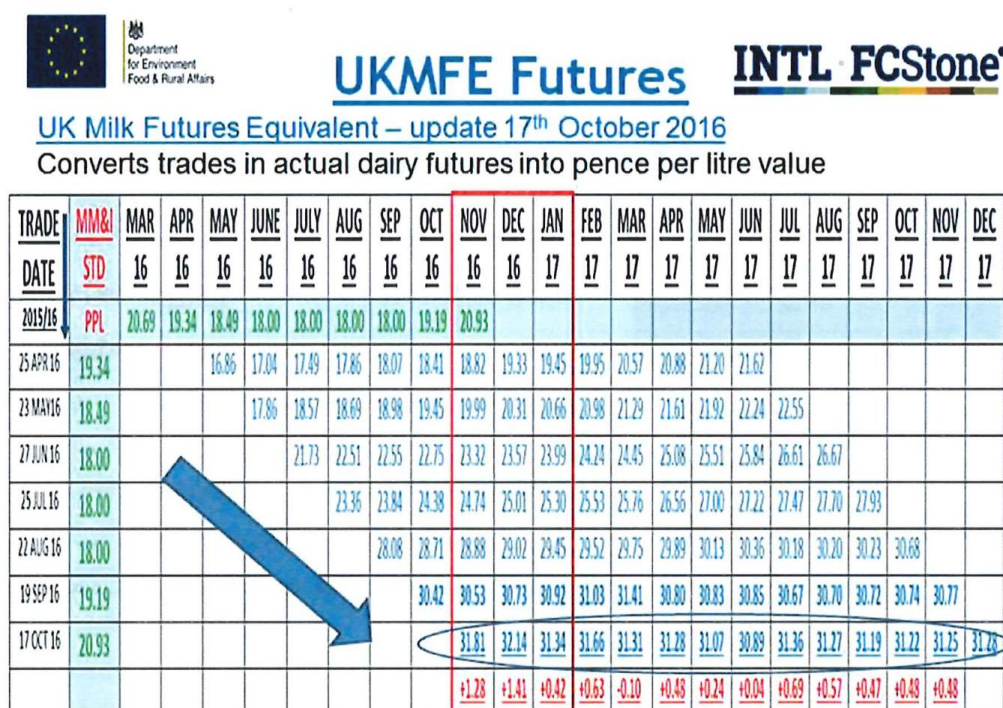
A wealth of market data and statistics exist to support dairy farmers and processors in their decision making (see <https://dairy.ahdb.org.uk/market-information/#.WWuDEXS1upo>).

The Barber’s milk contracts manager made no apology for pushing market data amongst members of the Barber’s milk pool, incorporating futures and AMPE data (see Figure 32) into

monthly newsletters, to encourage farmers to “start looking at markets closer than they’ve ever done before” (D: interviewee 22). As the AHDB suggest, you *do not have to be actively trading on the futures market for it to be of use*. Specifically, they highlight how “tracking European futures pricing can help shed some light on market prospects” and that “the price of a futures contract gives us information on what the market currently expects supply and demand conditions to be at the time of delivery (or expiry of the contract) relative to what they are now” (AHDB, <https://dairy.ahdb.org.uk/news/news-articles/august-2016/using-futures-to-read-the-market/#.WbvLDcYo9pg> accessed 15.09.17).

“I want farmers to become match fit with this sort of stuff, and the AMPE stuff, and forecasting, because ultimately it will make a difference because it’s when you’ve got those litres that are too much, that no market can sustain, things fall off, or the legs fall off, and likewise when you haven’t got enough milk, the wheels fall off” (D: interviewee).

Figure 38. Example of futures data provided by Barbers



Source: Barber’s – personal communication

The high degree of one-way transparency and information asymmetry in favour of the retailers has been described by Lehman *et al.* (2013) as ‘highly unfair’, positioning retailers in a stronger position to assert price claims against dairy companies. Specifically, Lehman *et al.* cite how the price paid by dairies to farmers is regularly published and argue that this information advantage, as well as the oligopolistic structure of the retail industry, means the retail industry is in a stronger position to assert its price claims against dairy companies. However, with reference to the availability of such information, the Barber’s interviewee argued farmers can, and should, use this information to their advantage.

Although this data is widely available, and can be used to improve farmers’ bargaining power, a number of interview participants noted farmers’ lack of engagement with such material.

“I bet actually, if you started going around talking to farmers, that actually you’d find a lot of farmers ... I’m not sure that a lot of them even know how much money they get for their milk sometimes” (D: interviewee 20).

Arla had a more sympathetic understanding of why farmers were not engaging with market information as much as they should, suggesting a lot of farmers are too busy. Interestingly, Barber’s efforts to get farmers to engage with such material was recognized by other interview participants as a good way of getting busy farmers to engage with this material.

There was some suggestion emerging from the interviews that farming in a time characterised by such volatility required a different set of skills – particularly business skills.

“There’s a lot more skills involved than there were 20 years ago” (Sedgemoor Focus Group, p.41)

“You’ve got to be business savvy, yes, you’ve got to know your margin” (Coombe Focus Group, p.23)

One farmer, who has set up a milk broker company, attributed farmers’ lack of engagement with such material to “the mentality of a lot of the farming community” (D: interviewee 20). Specifically, he argued many farmers felt they had a ‘God given right’ to sell their milk.

It is important to note the following distinctions regarding futures markets, emerging from participant interviews:

What is the futures market?

Futures are standardized, legal contracts based on the delivery of a specified quantity and quality of a commodity – in this case milk – at a set time and place. The value of the contract is negotiated at a futures exchange, which acts as an intermediary between the buyer and seller, and is based on the present-day value of the physical item. Futures contracts can be used by those involved in the supply chain (such as farmers and manufacturers) who are looking to reduce their risk and exposure to market volatility through ‘hedging’. The futures market allows both buyers and sellers to lock in a price for the future and spreads the risk between the seller and buyer.

Whilst futures markets for grains are long established, dairy futures markets are relatively new. There are currently only two exchanges in Europe where it is possible to trade dairy futures: namely the Eurex and NYSE Liffe. Dairy futures in these European exchanges have only been introduced relatively recently and AHDB describe them as being ‘in their infancy’; interestingly, one participant in the Coombe Focus Group thought it was not possible to trade milk on the futures market; a testament to its low uptake in the UK context to date. AHDB cite the use of dairy futures in the US, where markets have been operating for approximately 20 years, as providing a ‘glimpse of the potential’ for Europe.

(AHDB <https://dairy.ahdb.org.uk/news/news-articles/august-2016/using-futures-to-read-the-market/#.Wbvl6cYo9pg> accessed 15.09.2017)

(AHDB <https://dairy.ahdb.org.uk/news/news-articles/august-2016/using-futures-to-read-the-market/#.Wbvl6cYo9pg> accessed 15.09.2017)

It is important to note the following distinctions regarding futures markets, which emerged from participant interviews:

- **Traders:** Processors actually trading liquid milk and ingredients products on the future market (e.g. Muller milk and ingredients contracts)
- **Hedgers:** Processors using futures market data (e.g. UKMFE futures) to set fixed prices for suppliers who are able to hedge certain proportions of their produce against these fixed prices
- **Spectators:** Suppliers and processors who are using futures market prices to inform decision making and price negotiations

Participants were positive about the use of futures data as a means of controlling milk price volatility.

“It would enable everybody to have a say in what the price is going to be. Because they can understand how much a customer is willing to pay and work backwards from that” (Coombe Focus Group).

The main exception to this was organic farmers who felt the market was too small and already well enough controlled to not need such mechanisms for price stability.

“I don’t think there ever will be organically [need for the futures market], it’s too small” (Coombe Focus Group).

Whilst Arla had talked about the idea of futures market and had ‘some work going on about it’, the need for futures mechanisms will be related to the level of volatility we the industry can expect. The Arla representative argued the recent price volatility as an anomaly and anticipated that typically dairy farmers would try to ride out modest volatility, without the need for futures mechanisms.

OMSCO explained that they were not selling produce on the futures market per se, but they were utilising futures pricing mechanisms to offer their suppliers the ability to fix prices within their contracts.

Barbers were utilising the same approach. They were particularly proactive in getting their farmers to engage with such pricing mechanisms, printing the UKMFE on the back of the newsletter in a format which allowed farmers to engage with it quickly and efficiently.

“I’m starting to quote these future prices, now I think that there’s huge mileage in that [...] [it’s] translated in to pence per litres, so farmers can understand it [...] I believe it’s all part of the farmer’s armour that they need to have so as they need to be as smart as they can, rather than just blaming what the markets are doing, look at what the markets are doing, use the data, manage your own business. I think that’s the key, so I’m going to publish this every month” (Michael Masters, p.15)

5.5.6 The future (succession and social drivers)

There was significant concern from those interviewed that opportunities in dairy farming remained limited for young people without familial connections to the industry because of the high start up costs. Whilst participants recognised opportunities to be employed as a non-familial employee were abundant (see below), they feared entry into the industry in any other way was typically impossible because of the capital required to do so.

“You can work on a dairy farm quite easily, there’s people looking for jobs, you are looking for workers, but to start on your own, takes massive guts, and you need an opportunity and the opportunities aren’t there” (Coombe Focus Group).

This concern prompted participants to appeal for innovative start up initiatives such as share farming schemes developed in New Zealand.

Participants recognised an increase in interest in and enthusiasm towards agricultural work in contrast to recent years.

“I’ve had more people asking me for work than ever before [...] I think it has stepped up. I think people are getting more interested in it.” (Coombe Focus Group).

This positivity ties in with wider observations in the academic literature of a renewed interest in agricultural careers, attributable to the (re-)emergence of food security in the political agenda in developed market economies. The so called *renaissance in agriculture* (Whitehead, Lobley and Baker, 2012), has according to industry leaders, reinvigorated the appeal of the industry. On a more practical note, one participant attributed this increased interest in agricultural work to an increase in university tuition fees, forcing young people to look for alternatives, such as jobs or apprenticeships.

Whilst there was significant positivity about interest in the industry, others described dairy farming as generally unappealing – mainly relating to the unsociable working hours required, but also relating to the hard work required.

“If you’re not from a farming background, why would you turn down working 9 ‘til 5 and having every weekend off to go out with your mates, than working 4 o’clock in the morning until 9 o’clock at night?” (Young Farmers’ Focus Group).

Whilst a familial connection to the industry had been recognised as often the only way into farming, the family structure was also identified as problematic for the progression of young people in the industry. One participant described the inability of young people to have a say in the way the farm is run. This issue – also known as the ‘farmer’s boy problem’ – has previously been recognised in the family farming literature (see Gasson and Errington, 1993; Chiswell, 2016) and is considered highly debilitating for the younger generation. There is a wealth of evidence in the general business succession and farm succession literature that points to the negative implications of a slow or conservative handover of responsibilities to the younger generation. Interestingly, one participant identified 32 as a ‘peak time’ for successors and appealed they should be ‘right up there in the helm, doing the majority of the work’. There is scope here to think about how to facilitate succession in the dairy industry, so as to allow ‘young blood’ to come through and benefit the industry.

5.6 Brexit

5.6.1 Interview and focus group participants perspectives on Brexit

As a first step in the analysis of Brexit, interviewees and focus group participants in Task 2.3 were asked participants about the perceived impacts of Brexit on the industry. A brief analysis of the key findings is presented below. This general discussion also informs a more detailed analysis of Brexit-based scenarios, which are presented and discussed in the next sub-section.

Brexit represented a divisive topic. Participants had a range of views and responses to the Brexit vote and cited a range of potential implications for the dairy industry after the UK exits the European Union. In fact, some respondents refused to speculate on Brexit impacts because of the uncertainties surrounding future trading options. For example:

“I think we feel affected by it but to be honest with you, if anything it might improve our exports, but does anyone know what’s going to happen? [...] I mean, above me, they might

be [thinking about it] but [...] but it's not massive on our agenda [...] we are just cracking on with what we've got to do" (D: interviewee 18).

"It's no good getting worried about it [...] There's nobody even talking about it, that sort of thing, because what you discuss now could be totally irrelevant" (Coombe Focus Group).

Discussion centred on the following three concerns; each will be discussed in turn.

- Trade and a trade deal
- The availability of labour
- Subsidies and competitiveness

5.6.1.1 Trade and a trade deal

Trade, and specifically whether a trade deal with the EU would be secured, was the biggest post-Brexit concern amongst participants. Unsurprisingly, groups that were reliant on exports and/or the ability to move products across European boundaries were most concerned about the impacts of no trade deal.

"The big one is trade. The Arla model is that we move milk and product across European boundaries, freely to optimize the business. So for instance, all Lurpak is made in Denmark, and then imported into the UK, easily because there's no paperwork to worry about, there's no taxes to pay etc. etc. so what happens when we default to the WTP rules, and we have a 34 per cent tariff? That doesn't look so sexy anymore" (D: interviewee 16)

"In terms of the access or not to world markets, how the tariff barriers are implemented or not. Do we have free trade agreements with other part of the world? What is the relationship with Europe going forward?" (D: interviewee 21b).

Whilst those currently reliant on exports feared failure to get a trade deal would have a significant, negative effect, there was also recognition that it could open up lucrative export opportunities beyond Europe that could counterbalance loss of European trade.

Producers and organisations dealing only within the UK felt Brexit and a trade deal were of less importance and even saw Brexit as an opportunity for increasing demand for domestic products.

"We're seeing it already with the retailers, looking to cut out imported products. They are looking at British products" (D: interviewee 23).

"We're something like only about 60 per cent self sufficient in dairy products in the UK, is that right? [...] So you know there should be room for us to, if we are only 60 per cent self sufficient then we should be able to increase production by 20 per cent and charge what we want and we've not done that" (D: interviewee 23).

Others also saw Brexit – specifically a reduced ability to trade freely with Europe – as an opportunity to develop other international markets.

5.6.1.2 Labour

There was some concern that Brexit, and particularly a hard Brexit, would limit the industry's ability to access vital labour, including in processing and haulage. For example:

"Where I used to work, they used to have ... it was a proper intensive unit there, and they had, I think it was 12 Polish or Lithuanian people [...] they are important people though because English people don't really want ... they don't want to do the hard work do they?" (Young Farmers Focus Group).

A recent Environment, Food and Rural Affairs Committee report (EFRA, 2017) has reported how witnesses to their investigation unanimously claimed they had "long struggled to find sufficient labour to meet their needs, either from the UK or overseas sources", notably "they considered that these problems had worsened since June 2016 following the UK's decision to leave the EU" (p.1). The report highlights the industry's reliance on foreign workers, primarily from other EU countries. They believe around 20 per cent of all regular, full-time staff in agriculture are thought to be migrant labour, largely from Romania and Bulgaria.

5.6.1.3 Subsidies and competitiveness

Although participants in the Sedgemoor Focus Group recognized that dairy – as a high turnover industry – was not especially dependent on agricultural subsidy, they did agree that a lack of subsidy in comparison to their European counterparts may result in unfair competition.

"If your competition, which is in Ireland, and France and so on, and they continue to receive basic payments and you're [not], it's unfair competition. That would be one of the biggest things" (Sedgemoor Focus Group)

Another Sedgemoor Focus Group participant, who was a young dairy farmer, claimed to be excited about the possibility of no agricultural subsidy post-Brexit, which he argued might potentially help young farmers and new entrants wanting to establish themselves in farming.

"Being a young person, I'm not directly a massive fan of this support, because I think that ... the guys here are all great farmers, and they are making use of their land, and single farm payments are a little bonus, but there's lots of farmers around us which are, kind of got 250 acres, which they are not doing anything with, because they are using their ... they have got £25,000 coming in a year for their Single Farm Payment. They can live off that. And I think while the Single Farm Payment's being given out as a level playing field, per acre, across the whole country, it's perhaps directed the wrong way" (Sedgemoor Focus Group, p.25)

Members of the Young Farmers Focus Group expressed a similar opinion.

"I personally think it's pretty good for young people, because like the subsidies are just propping up farmers that ... they've got 380 acres of grass and they just cut once a year and then claim all the money and then don't do anything with the land, and like for young people wanting to get into farming, those people are just sucking up the farms everywhere and keeping the land price high" (Young Farmers Focus Group).

Although interviewee recognized the importance of agricultural subsidies to dairy farmers whilst “the job has been on the headline” (D: interviewee 20) but recognised that “we should, as an industry, be able to survive without agricultural support”

Organic industry members had specific concerns. OMSCo members, for example, were worried about the implications for organic standards and associated market opportunities. “Brexit will determine to a degree what organic standards the UK has to adhere to as a minimum” (d: interviewee 21a). If the UK wants to continue to trade internationally it will be important to adhere to (or exceed) those standards.

Despite the above concerns, broadly speaking, the idea of Brexit was viewed quite positively amongst those surveyed in the dairy industry. Interviewees suggested that Brexit provided an opportunity to devise our own agricultural policy.

“Having a domestic agricultural policy ought to be beneficial, because it can focus purely on the UK rather than having to be agreed by 27, 28 Member States and the inevitable compromises that come with that” (D: interviewee 16).

5.6.2 *Brexit scenarios*

Building on the work of van Berkum et al. (2016) and Buckwell (2016), four Brexit scenarios were developed relating to **trade** and **policy support** (see below). They were designed to facilitate a discussion on the future of the dairy industry and more specifically the potential impacts of Brexit (depending on the final outcome) on the dairy industry in Somerset and beyond. The scenarios started with a status quo option, where policy support is as it is now and access to the single market remains to a trade liberalised option where trade barriers are significantly reduced and there is no longer pillar 1 support (i.e. deregulation). Having presented the above scenarios to the 10 workshop participants, they were divided into two groups of five to discuss/consider each of the different scenarios and their potential implications for UK dairy. The responses to the Brexit scenarios are discussed in the following sections.

Before we started the scenario activity, we asked participants to respond to the following questions in the table below (Table 14), individually. This was intended to facilitate the subsequent discussion, nonetheless, the full details of the participants’ responses are available for information in appendix 14.

Table 14. Somerset dairy farming – looking to the future (summary of results)

What are your priorities in relation to Somerset’s dairy industry over the next five years?	How will these be best achieved ?	What will be the key challenges/uncertainties in relation to Somerset’s dairy industry, both during the negotiations and post-Brexit?
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Scenario 1: Baseline/status quo

Under this scenario the UK leaves the EU, but continues to have free access to the Single Market and continues to have full access to the four EU ‘freedoms’ (labour, capital, goods and services).

As part of this scenario, the UK would adopt a British Agricultural Policy (BAP), requiring the same budget contributions as the CAP. Direct support would remain the same as current levels.

Scenario 2: A Free Trade Agreement (FTA) between the UK and the EU

Under this scenario the UK seeks a FTA with the EU. This option is not as advantageous as free access to the Single Market that EU membership confers but inclusion in the EU Customs Union is a possibility. Whilst some products will not be subject to tariffs, ‘sensitive products’ such as milk may be subject to some form of tariff e.g. Tariff Rate Quotas. Agricultural matters are normally the most difficult part of any FTA, so a functioning FTA may take many years to be agreed.

As part of this scenario, levels of direct support would be 50% of their current levels.

Scenario 3: WTO-default position – ‘no deal agreed’

If no deal were to be agreed, the UK would revert to the WTO-default position and would trade with the EU on the same basis as other WTO members. In other words, UK imports/exports would fall under the WTO’s non-discrimination Most Favoured Nation (MFN) rules and would be subject to a 36% tariff. The EU would apply a Common Customs Tariff (CCT) to UK imports and border and customs controls would increase.

As part of this scenario, levels of direct support would be 50% of their current levels.

Scenario 4: UK trade liberalisation

In this scenario, the UK allows wider access to UK markets by reducing tariff rates by 50% across the board (i.e. removes barriers to trade). This scenario is similar to the WTO-default scenario, including increased trade facilitation costs, with the only difference that the UK and the EU have different border tariffs: the UK applies 50% MFN tariffs to all imports and the EU applies CCT to UK exports to the European Union.

As part of this scenario farmers would no longer receive any agricultural support.

5.6.2.1 General reactions

As was the case during the interviews, workshop participants were uncertain about what post-Brexit scenarios was most likely to prevail.

Facilitator	"In terms of these options are there any one which are more likely to happen? Is it really you know 'we just cannot comment at this stage'?"
WSP1	"I think because the politics is going to play such a big role in it"

In view of this uncertainty, workshop participants tended to talk about the implications of Brexit in general terms. It was felt that whatever scenario was adopted, it would be less protectionist than the status quo and would expose the dairy industry to more competition, for which it would have to be fitter and more competitive.

Workshop participants perceived one of the biggest challenges associated with the Brexit scenarios (FTA, WTO and Trade Liberalisation) to be the infrastructure and manpower required to deal with border control. Incidentally, this was not something that emerged during interviews.

"There are no infrastructure at the ports right now, to do any of these things ... so the biggest challenge for moving any product, either way, is that there is no infrastructure. So how would you manage that? You talk about soft borders in Ireland, but Dover is not geared up in any shape or form for any kind of inspection, any kind of border control, so what's the electronic systems that we are going to have to have ... on all of that. It takes some quite serious thinking, because at the moment, we are not geared up for that at all" (WSP4)

There was some feeling amongst workshop participants that in anticipation of the policy change, Brexit was *already* having an impact on farmers in terms of their business decision making and the availability of labour. Even before any decisions regarding the free movement of labour have been made, the weakening of the pound following the referendum has already limited the availability of Eastern European workers.

"There's farms near us and local people want to buy them and people are saying to them "would you like to rent the ground from us" but the farmers are saying they don't want to enter into a five-year agreement because there may be no SFP so it's already affecting agriculture now" (WSP4)

"I've got a neighbor that's looking for a herdsman at the minute and he's gone to LKO that supplies labour, and he's been looking ... but all the Romanians, all the Poles, they've all gone back home. You know ... 20 per cent, they're cutting their income that they can send home [...] and that's 20 per cent of their available income has disappeared over night, because of the currency" (WSP6)

There was concern that reliance on labour extended beyond the availability of seasonal labour in the dairy industry, which has relied on European workers to perform skilled work for a substantial period of time. This reliance is not limited to on-farm labour either, but extends to the whole dairy supply chain.

"It's not just seasonal that's ... seasonal is really important to the horticultural sector and that's because there's a lot of skilled labour ... that's been there for so long we actually

forget they're migrant labour that might have been on the farm for 10 or 15 years but if they don't have the ability to replace them with the same, if you look in the dairies, and I don't know about next door here, but I know at Droitwich there's a massive you know ... ¾ of the people that work in there wouldn't be classed as white British, you know so ...” (WSP6)

5.6.2.2 Likelihood of scenarios

It is initially worth analysing the number of responses elicited by each of the scenarios. Responses pertaining to each of the scenarios across the entire workshop transcripts were coded in qualitative analysis software (QSR NVivo) and the number of references were calculated using a basic coding query. The breakdown of the the percentage of references are presented in Table 15 and diagrammatically in Figure 39 (where each colour represents references to one of the four scenarios and each segment represents a node). If we understand the status quo and trade liberalisation as the ‘extreme’ scenarios (as depicted in Figure 40 by being at either side of the spectrum), it is perhaps unsurprising that workshop participants engaged less with these ideas (12.9 and 14.3 per cent respectively, and engaged more with ‘more likely’ FTA and WTO scenarios (35.7 and 37.1 per cent of references, respectively).

Figure 39. Number of times each scenario was discussed in the workshop

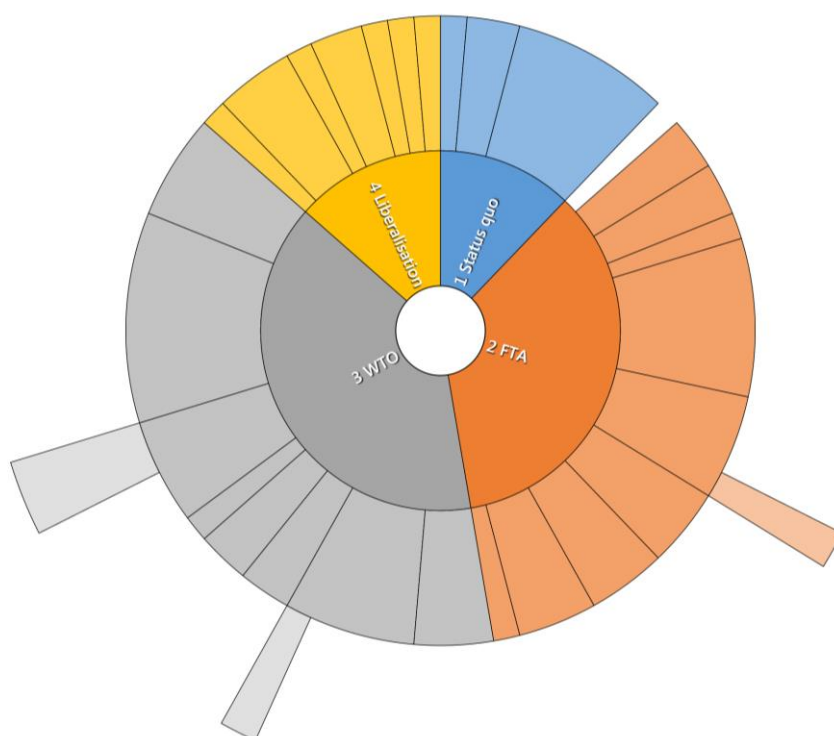
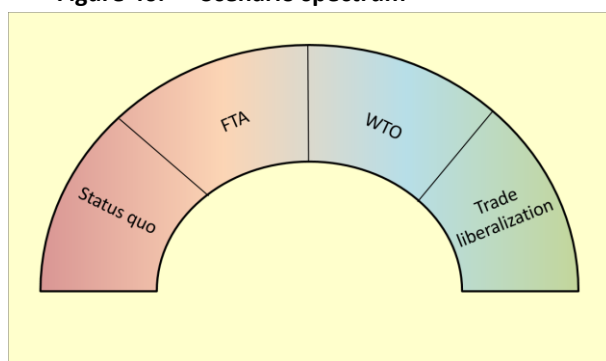


Table 15. Breakdown of scenarios

Scenario	Responses (%)
1. <i>Status quo</i>	12.9%
2. <i>FTA</i>	35.7%
3. <i>WTO</i>	37.1%
4. <i>Liberalisation</i>	14.3%

Figure 40. Scenario spectrum



The limited engagement with these scenarios was because they were considered extreme and therefore unlikely.

“I think one and four are unlikely” (WSP9).

“It’s never gonna be exactly the same. Obviously [it will] evolve but because we are on our own it would I suppose... it would be less drastic changes. I guess there are so many questions around the politics of the negotiation isn’t it?” (WSP1 with reference to status quo).

“The baseline, we didn’t spend much time on that didn’t we? Because we said that that wasn’t very feasible in any case” (WSP1).

Participants swiftly noted that the status quo, although desirable, was unlikely.

“From a dairy point of view most people would probably want number one but that was not going to happen” (WSP4).

They recognised the irony that “a lot of farmers have voted for ... to get out, still want a Single Farm Payment, don’t they?” (WSP6).

There was also a feeling amongst the two groups that a trade liberalisation scenario would be ‘dangerous’. Participants attributed this to the issue of equivalency; liberalisation could mean that US products, not made to the same standard as the UK, would be able to undercut the UK’s prices.

WSP6 “I think it’s quite a dangerous scenario”

WSP4 “I think it depends where the US sits in that [...] because of all the US products that are not comparable in how they’re produced and if there was a liberalization and not an agreement on standards, then they would seriously undercut the UK ... so they use hormones for example in milk production”

However, participants made a number of references to the success of New Zealand compared to protectionist regimes such as Ireland.

“You could argue now that the New Zealand dairy sector went huge amount of pain and agony when the liberalisation took place but it is absolutely flying now. you know the examples often quoted is that Ireland and New Zealand produce exactly the same amount of milk the year before the milk quotas were introduced. So Ireland went the milk quota

route, New Zealand went the liberalisation route. New Zealand now produces six times more than Ireland- there is a huge difference" (WSP9).

5.6.2.3 The transition period

Having established that options one and four were 'extremes', much of the remaining discussion focussed on scenarios two and three – the middle scenarios. Participants saw the WTO as a possible interim option on the way to a FTA, and felt the eventual outcome might be 'somewhere in the middle' depending on the negotiations. Even within the FTA, it was felt there were different arrangements.

WSP4	"For me I'd say option 2 is the most likely one but where it sits on the spectrum ..."
Facilitator	"But there's grades of option 2 isn't there?"
WSP5	"Absolutely"

After the status quo, the FTA was considered the most desirable option (and perhaps the most likely option in the long run). However, participants felt it was not going to be easy to implement and would likely take some time – perhaps even a decade.

WSP6	"For me [FTA] it's probably where we'll end up but I think it'll take a long time to get there"
Facilitator	"Yeah yeah OK ... it's hard to put a time on it, but at least ten years?"
WSP6	"For me [FTA] it's probably where we'll end up but I think it'll take a long time to get there"
Facilitator	"Yeah yeah OK"
WSP6	"Yeah yeah ten years, but in the meantime we need some kind of transition to be honest"

WTO was seen as the likely outcome of a 'snap decision' or a failure to come to any agreement.

"WTO would likely to be a rapid decision made because we are fallen out and we kind of have to sort of be walking away- so we would have very limited time to adjust... Whereas the FTA will give us time to plan. So you might be in a phased approach" (WSP7)

5.6.2.4 Opening the door to competition: implications for dairy

It was anticipated that dairy farming following Brexit would need to be more competitive, regardless of the exact scenario adopted. Without the security of unlimited free trade within the EU (the status quo) and direct support, it was felt that the dairy industry would need to 'up its game' to compete in the global market. Initially, there was some concern around the UK's ability to do this successfully when their EU counterparts would continue to get subsidies and the UK would receive either a reduced amount (under the FTA and WTO scenarios) or none at all (Free Trade scenario).

“We’ve got to be able to compete with them. If they’ve got something that’s distorting the market ... do you know what I mean? There needs to be a period of transition, because even being taken down a particular route ...” (WSP6).

However, participants also recognised how the EU budget was unlikely to remain the same, and that this might go some way to levelling the playing field, should the UK receive less or no agricultural support in the future.

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| WSP6 | “Europe won’t have the same either. Because they’re discussing their CAP now, and they’re talking about tools to maintain income, they’re talking about ... they’re language is very different as well. So if you listen to the Commissioner, he’s talking a very different language now ...” |
| WSP10 | “He’s got a very different budget to work with now” |
| WSP6 | “Yeah ... I was with some Italians recently, and their biggest concern was who is going to fill the hole that we will leave to maintain their budget. Well it’s probably not going to be maintained is it?” |
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That said, overall participants took a more positive view on the potential reduction of agricultural support; they felt it offered an opportunity to revise the way agricultural support is targeted and could eventually help to increase the industry’s productivity, efficiency and resilience in the global market.

“Needs to be a little bit more tailored and a little bit more around productivity, so we get more efficient as dairy farmers and as an industry, rather than, what’s happened in the past ... farmers haven’t sort of innovated, have they? Some have. Great. But not everybody. We need to encourage productivity” (WSP6).

This message has been echoed in farming policy. For example, George Eustice MP describes Brexit as an opportunity to redesign policy support:

“The greatest opportunity we have in leaving the EU is to design a better, more coherent domestic policy to support farmers to become more profitable, to support environmental outcomes and to promote things such as animal welfare” (The Minister of State for Agriculture, Fisheries and Food, George Eustice MP)

Rather than direct support, workshop participants anticipated indirect mechanisms, i.e. payments for research, skills development and teaching, tax incentives etc. as a possible way of delivering agricultural support for a more efficient dairy industry.

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| WSP6 | “What support we have, should be focused around managing volatility. So creating tools to manage volatility, so actually, you know, we all know there’s actually some really innovative precision farmers out there ‘we can get better’, you know, we can all get better but actually the system as it’s been based at the minute has allowed some farmers to be inefficient ... I mean that will be a |
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bigger issue for the red meat sector I think, than us, but equally as much, there's no God given right to be able to make a living as a dairy farmer, if you're not efficient"

A revised agricultural support system was also felt to offer the opportunity to ensure future mechanisms would support both younger farmers and new entrants.

"Single Farm Payment distorts a massive amount of things. It keeps farmers on the farm that maybe should retire and allow younger people to farm. Because they won't leave because there's a payment coming through, so they can actually sit there with a dog and a stick and take the SFP, and actually be quite unproductive, which actually doesn't help the younger generation [...] we need to somehow make sure we are on a level playing field, but maybe do it in a different way, that would be my view" (WSP6)

Participants explained how the reduction or abolishment of subsidy, and the increased exposure to global markets and competition, associated with all options but especially the status quo, would cause structural change in the dairy industry.

"If we open the door to competition, then [...] there will be a structural change" (WSP1)

Generally, it was anticipated that 'opening the door' to competition would intensify and quicken current trends in agricultural restructuring – specialisation and increasing farm size.

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| WSP7 | "Parts of the country will look very different – especially arable parts probably..." |
| WSP1 | "It could just enhance the moves that are already happening slowly. Dairy farming could concentrate even more in the west..." |
| WSP7 | "Larger fields of maize..." |
| WSP1 | "Farms are likely to get... I think the trend is gonna carry on regardless where we go. It's just the speed at which it happens" |
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More specifically, with reference to dairy, there was some suggestion that in a bid to increase competitiveness to survive in a more open market, "production systems will go either in one or two directions" (WSP1) either fully-housed, or low-cost grazing.

"You are likely to get more polarisation than you have. I don't know if you are going to get completely one of the other but it will certainly be more those two directions" (WSP1).

"There will be a split because the aligned guys on the liquid side, they can't do grass – based. Because you can't guarantee the consistency of production with the grass-based can you?" (WSP7).

5.6.2.5 *WTO scenario: an opportunity to increase domestic production?*

The WTO default position proved most controversial and illicited the most discussion. Initially, there were some significant concerns regarding the implications of the WTO default position for the industry. It was synonymous with a 'hard Brexit' throughout the discussions.

Facilitator	"In terms of these options that we've got down, the four, are any of them like 'dear Lord, let's please never go there'?"
DWSP6	"We don't really want the WTO default position really?"

Participants connected with Arla and Muller were most concerned about a WTO scenario. This was unsurprising given the importance of free movement of goods and access to the European market that was so integral to their respective business models.

"Bear in mind that Arla and Muller Wiseman probably account for 45% of the market in the UK. They are both multi-national businesses. And hard Brexit with no trade agreement would adversely affect the viability of those businesses. So that would be a bad thing for the UK" (DWSP9).

Equally, some participants recognised the WTO position as an opportunity for domestic production. This demonstrates the importance of recognising the different institutional arrangements when considering the implications of post-Brexit policy; different scenarios will have different implications for the different arrangements.

"I think for milk in general, WTO may not [be good] ... for others, it may not be too bad a thing. With my Arla hat on, it makes our business pretty much unviable if we can't move things between countries ... all the market advantage that we've got in those market products that we can move around is suddenly gone with a 30-odd percent tariff, all the margins taken out of them so they're two possible outcomes ... with my NFU hat on, if you like, but for dairy as a whole, ignoring the red meat and all the other sectors, just dairy, the WTO is not too bad, but for the 25 per cent of us who are in Arla, it's probably the worst of all the options" (DWSP10).

"What are we, 81 per cent self-sufficient? And I think, when you put it in euros, there's one billion Euros worth of dairy products going out of the UK and 3 billion worth comes in, so that actually you could say is an opportunity in effect, couldn't you?" (DWSP6)

"Fortress Britain [...] that actually works well for dairy [...] but for dairy that presents some opportunities in terms if you say go to the extreme level of the WTO for trade agreement" (DWSP9).

"If you are mostly a domestic business with a little bit of export, probably with a WTO- it could do you well" (DWSP9).

This stance was echoed amongst the House of Lords Select Sub-Committee on the European Union (<https://publications.parliament.uk/pa/ld201617/ldselect/ldcom/169/16906.htm> accessed 15.09.17), who claimed:

“We are only 61% self-sufficient across the commodities and 75% self-sufficient in our indigenous products, so there is huge scope to make sure we provide the standard of product that our consumers want”

Although there was initial enthusiasm for domestic producers under a WTO option, there was concern that becoming entirely self-sufficient in dairy would eventually thwart both investment and innovation.

“I think if we became insular and put a brick wall around ourselves, we are not going to allow any dairy products in [...] ultimately, our industry would die because you get a lack of investment and everyone would stop investing and the industry would slowly ... it might last my lifetime but ultimately, it wouldn't be a positive industry would it? Because it would only be servicing its own ... all the innovation, all the investment would stop, because the growth areas are outside of the UK, so once you've hit that 100 per cent then you're knackered then aren't you?” (DWSP6)

DWSP1	“For dairy that [substituting imports] presents some opportunities in terms of if you go to the extreme level of the WTO for trade agreement [...] You haven't got any more opportunities after that [...] there's no growth potential if you are not competing”
Facilitator	“There is a plateau isn't it?”
DWSP9	“Well that gives us a fair bit ... 60% substitution”
DWSP1	“Yeah but it caps the growth”

Linked to this, there was also concern that a focus on domestic production and self-sufficiency would require costly investment and innovation to meet demand. This was amplified by the fact the UK was felt to be ‘behind the curve’ in terms of investment in robotics etc.

“That provides an opportunity to fill that space but you know...for those products that we can only produce here it provides an opportunity to perhaps expand into more products and higher volumes. But on the down side of that it requires investments. So will we have that investment – that is the question. Will there be enough investment to provide that opportunity?” (WSP1).

“If we want to be self-sufficient a massive amount of investment will have to go in. we are so far behind on robotics. We are probably about 25% off the way forward compared to some of our European counter-parts” (DWSP7).

6 Producer survey report

6.1 Introduction and methodology

In what follows the results of Task 2.6 (“Producer Survey”) are presented and discussed for the UK case study on dairy farms in Somerset and Devon.

The survey was designed to achieve an in-depth knowledge of the supply chain arrangements in the dairy sector in Somerset and Devon. More specifically, the objectives of the survey were to:

- A. Map the existing supply chain arrangements between milk producers (farmers) and milk buyers, describing the different typologies of transactions and arrangements, as well as their prevalence, in the dairy sector in Somerset and Devon;
- B. Identify the attributes characterising the supply chain arrangements, including collecting information about how different parameters of a given type of arrangement (e.g. quality level, length of contracts, services) shape the terms of the relationship between producers and buyers (e.g. price formation, costs of arrangements);
- C. Assess the sustainability of the supply chain arrangements through producers’ opinions and perceptions of the sustainability of the agreements and their attributes, disentangling potential effects on the three pillars of sustainability – i.e. environmental, social and economic;
- D. Identify future drivers and strategies of dairy farmers, in response to potential emerging issues such as adverse climatic conditions and pests, market changes and price volatility, policy and regulatory reforms.

In order to collect the relevant information to achieve the above objectives, a random sample of 200 dairy farms in Somerset and Devon was drawn from the local population of dairy farms in the two counties. According to the most recent Defra estimations, the current number of dairy farms in the two counties is 1,300. Given the current population size, the sample of 200 farms guarantees a margin of error of about 5%, which is statistically acceptable (the commonly accepted threshold is $\leq 10\%$).

Farmers were interviewed by telephone during the period November-December 2017, using a questionnaire composed of about 200 questions for an average interview length of 35 minutes. Farmers were asked to provide information about their dairy farm relative to the latest completed financial year (2016-17).

The questionnaire was composed of the following sections:

- A. Farm business characteristics
- B. Production and sales channels
- C. Characteristics of the sale agreement and sustainability
- D. Strategies and drivers of farming
- E. Farmer characteristics

For the purposes of this report, data are analysed using descriptive statistics.

6.2 Farmer and farm characteristics

The sample is composed of 88 farms located in Somerset and 112 in Devon. This proportion reflects the higher total number of dairy farms in Devon. In the sample, the majority of interviewees were the farm owner, farm manager, or farm owner/manager (Table 16).

In terms of demographics, the majority of surveyed farmers were male (89%) and the majority were between 41 to 65 years of age (see Table 16). Young farmers accounted for 12.5% of surveyed respondents. Having a secondary level of education, especially higher secondary schooling, was the most common situation reported and 57% of farms have received a specialised agricultural education.

Table 16. Farmer and farm characteristics

Characteristics	Description	N. of farms	%
Region	Somerset	88	44.0%
	Devon	112	56.0%
Status on the farm	Farm owner	104	52.0%
	Farm manager	10	5.0%
	Farm owner & manager	65	32.5%
	Tenant	21	10.5%
Age	40 years old or less	25	12.5%
	41 - 50 years old	46	23.0%
	51 - 65 years old	97	48.5%
	More than 65 years old	32	16.0%
Gender	Male	178	89.0%
Education	Primary	3	1.5%
	Lower secondary	74	37.0%
	Higher secondary	92	46.0%
	University	31	15.5%
	Special agricultural education	114	57.0%
Succession	No expectations	74	38.0%
	Family member will take over	106	54.4%
	Sell the property	10	5.1%
	Give up tenancy	5	2.6%
Type of farm	Individual farm	13	6.5%
	Family farm	162	81.0%
	Private company	22	11.0%
	Publicly owned	2	1.0%
	Public-private partnership	1	0.5%
Organic farming	Fully organic	11	5.5%
	Conventional	188	94.0%
	Partially organic	1	0.5%
Memberships	Cooperative	89	44.5%
	Producer Organisation	43	21.5%
	Farmers Union	148	74.0%

More than half of the survey participants expected that one day the farm will be taken over by a family member (54.4%), but about 38% were still unsure about the future of their farm and did not have particular expectations or plans in place regarding farm succession.

In terms of legal organisation, family farms were the most frequent (81%) and a few were private companies (11%). Organic farming was not a frequent option, adopted by only 5.5% of the dairy farms surveyed (reflecting the general conventional/organic trend).

To be a member of at least one farmer organisation was very common in Somerset and Devon. About three out of four farmers (74%) were members of a farmers' union, but membership in cooperatives and/or POs were also quite frequent among dairy farmers (44.5% and 21.5% respectively).

It is interesting to note the different roles that farmers' organisations have with respect to their sales arrangements. The main role of cooperatives was to buy farmers' milk (82%) (Table 17), while POs provided a wider range of services beyond purchasing milk, acting as intermediaries with other buyers in negotiating prices (44.2%) and supporting the design of terms of contracts between farmers and buyers (46.5%). On the contrary, farmers' unions have a bigger role in providing farmers with legal advice (39.2%) and insurances (46.6%).

Table 17. Services provided by farmers' organisations

Services provided by the organisation	Coop		PO		Union	
	N.	%	N.	%	N.	%
Buys the milk	73	82.0%	18	41.9%	6	4.1%
Puts me in contact with a buyer	8	9.0%	14	32.6%	3	2.0%
Negotiates the price for me with a buyer	27	30.3%	19	44.2%	5	3.4%
Supports the design the term of the contract/transaction with a buyer	28	31.5%	20	46.5%	17	11.5%
Legal advice	0	0.0%	0	0.0%	58	39.2%
Insurance	0	0.0%	0	0.0%	69	46.6%

Table 18 provides details on the characteristics of the dairy farms surveyed. The average farm size was 183.7 ha, which is above the South West and national averages of 70 ha and 86 ha respectively. About 78% of the farm area was used for the production of milk, and the remaining area for feed and fodder production.

The average herd size was 237.6 lactating cows with an average productivity of 7.9 thousand litres of milk per cow in one year. In some farms, productivity reached peaks of 15 thousand litres which is almost doubles the national average (AHDB 2017).

Table 18. Farm characteristics

Characteristics	Mean	Min	Max
Total area of farm land (Ha)	183.7	30	1214
Land for milk production (Ha)	142.6	4	1011
N. of cows	237.6	17	1600
Yearly cows yield ('000 litres/cow)	7.9	1	15
Total yearly milk production ('000 litres)	1855.7	20	23000
Percentage of milk sold (%)	96.7%	0%	100%
Farm Income (% of total household income)	89.1%	1%	100%
Dairy Income (% of farm income)	80.7%	20%	100%
N. of full-time workers	3.8	0	34
N. of part-time workers	1.3	0	7

Most farms entire milk production was sold on the market (96.7%), therefore the level of self-consumption was very low.

The main source of income for farm households was agriculture, with just under 90% of farm household income coming via agricultural activities. Within the farm income, milk was the main income source (80.7% of farm income), suggesting that farms surveyed were mostly specialised.

About 52% of the farms surveyed did not diversify and were purely specialised in milk production. Although farms in the sample are quite specialised, they diversify production by combining one or two additional activities to milk production. Production diversification can be considered a way to manage risks, by balancing a portfolio of products so that low performances in one product (e.g. milk) are compensated with better performances in other ones (e.g. meat), provided that the probability of simultaneous failure of two or more productions is very low (Vigani *et al.*, 2015). Among the diversifying farms, meat and arable crops productions were the most frequent for diversification.

However, the main risk management strategy reported was insurance (Table 19), specifically a combination of two or three insurances among crop, livestock and income insurance. About 88.5% of the farms had a livestock insurance to cover against herd diseases and losses, but only 12.5% were insured against crops risks.

Interestingly, 35.5% of the farmers adopted income insurance. Income insurance compensates farmers for losses of income above a certain threshold (e.g. farmers are compensated if the annual income is 30% lower than the 5 year average income). While crop and livestock insurances are mainly intended to cover against production risks such as weather disasters or diseases, income insurance is designed to cover farmers against market risks such as price volatility (Tangermann, 2011).

Table 19. Risk management strategies and attitude to risk

Risk management strategy		N.	%
Diversification:	Arable crop	47	23.5%
	Fruit orchards	11	5.5%
	Vegetables	2	1.0%
	Meat	115	57.5%
	Rural tourism	22	11.0%
	Other	34	17.0%
Insurance:	Crop	25	12.5%
	Livestock	177	88.5%
	Income	71	35.5%
Risk attitude		Mean	
Willingness to take production risks		2.77	
Willingness to take marketing risks		2.28	
Willingness to take financial risks		2.36	

In order to assess the risk attitude of dairy farms in Somerset and Devon, during the interviews they were asked if, on a scale from 1 (strongly disagree) to 5 (strongly agree), they believed they were more willing to take risks than their colleagues with respect to dairy production (e.g. adopt new milking regimes, new fodder, new breed of cow), marketing and pricing risks (e.g. experiment with new sales channels, new markets) and finance (e.g. loans for production facilities, new investments). Results at the bottom of table X show that, on average, for each type of risk assessed the answers were below 3 (threshold for risk taking) suggesting that the surveyed farmers were quite risk averse.

6.3 Sales channels and agreements

During the survey, farmers were asked to break down the milk's sales among a variety of possible channels, distinguishing between sales to collective organisations (e.g. cooperatives and POs) and individual businesses (e.g. processors, retailers).

Despite opportunities for diversification among different buyers, sales channels were dominated by cooperatives (81.2%) and processors/the food industry (93.9%) (Table 20). In the sample, a larger number of main sales (a main sale was defined as the sale of the largest proportion of milk produced during the year in a single transaction to a single buyer) were directed to individual businesses (58.5%) rather than to collective organisations (42.5%). Interestingly, only a few farmers, less than 3.5%, sold milk to a mix of buyers.

As shown in Table 20, the types of agreements between producers and buyers were different for collective and individual organisations. In the first case, the details of the transactions were mainly outlined in the rules of being a member of the collective organisation (62.7%). For example, the duration of the agreement, milk prices and any services were part of the

agreement for being member of a cooperative or a PO. In the second case, 70.9% of transactions' details were formally agreed with a legally enforceable contract, signed before the delivery of milk.

Table 20. Sales channels

Sales to collective organisations			Sales to individual businesses		
	N.	%		N.	%
Cooperative	69	81.2%	Local markets or final consumers	0	0%
Producer organisation (PO)	13	15.3%	Independent small shops or restaurants	0	0%
Inter-branch organisation (IBOs)	0	0%	Processors/agri-food industry	108	93.9%
Farmers' union and association	0	0%	Supermarkets/retailers chains	2	1.7%
Other collective	0	0%	Traders/Wholesalers	2	1.7%
Mix of the above	3	3.5%	Exporters	1	0.9%
			Mix of the above	2	1.7%
Total collective sales	85	42.5%	Total individual sales	115	57.5%
The main sale was to:					
A collective organisation	83	41.5%	An individual organisation:	117	58.5%

Table 21. Characteristics of sale agreements

		Collective		Individual		All farms	
		N.	%	N.	%	N.	%
Type	Formal before delivery	25	30.1%	83	70.9%	108	54.0%
	Formal at delivery	2	2.4%	9	7.7%	11	5.5%
	Informal before delivery	4	4.8%	14	12.0%	18	9.0%
	Informal at delivery	0	0.0%	1	0.9%	1	0.5%
	Membership rules	52	62.7%	10	8.5%	62	31.0%
Duration	Less 3 Months	0	0.0%	1	0.7%	1	0.4%
	3 to 6 Months	3	3.0%	6	4.3%	9	3.7%
	7 to 12 Months	19	18.8%	19	13.6%	38	15.8%
	13 to 24 Months	0	0.0%	1	0.7%	1	0.4%
	25 to 60 Months	5	5.0%	5	3.6%	10	4.1%
	More 5 Years	56	55.4%	85	60.7%	141	58.5%
	Evergreen contract	18	17.8%	23	16.4%	41	17.0%
Payment moment	Before delivery	0	0.0%	1	0.5%	1	0.2%
	At delivery	0	0.0%	1	0.5%	1	0.2%
	After delivery	74	37.4%	68	32.2%	142	34.7%
	Middle and end season	36	18.2%	24	11.4%	60	14.7%
	On regular basis	82	41.4%	115	54.5%	197	48.2%
	Other	6	3.0%	2	0.9%	8	2.0%

Table 20 also shows that sales agreements have relatively long-term duration, frequently being valid for more than 5 years both for collective and individual buyers. The time when farmers are paid for the milk can vary, but more frequently payments occur on a regular basis (e.g. weekly or monthly) after having delivered the milk.

In addition to the type of agreement, farmers were also asked for details of the content of such agreements. These details are shown in Table 21. The most frequent features for both collective and individual sales agreements concern sales exclusivity (i.e. the buyer requests that the farmer sells milk exclusively to him and not to other buyers); the possibility to obtain price premiums for higher quality milk; the provision of logistic services for the milk, such as collection, storage and transportation, from the buyer. These features concern more than 50% of individual buyers and just below 40% of collective organisations. Managerial support and technical assistance was also a frequent service outlined in the agreement, concerning 26.5% of agreements with collective organisations and 34% with individual businesses. Just over 20% of the agreements with individual businesses also included the possibility of penalties if producers fail to deliver the agreed quantities.

Other features, such as interests on delayed payments, credit assistance and special assets were not particularly well developed in the dairy supply chain arrangements surveyed.

Table 22. Attributes and services in dairy sale agreements

Attribute	Collective		Individual		All farms	
	N.	%	N.	%	N.	%
The agreement requires exclusivity	75	37.5%	102	51.0%	177	88.5%
There are penalties if fail to deliver the agreed quantities	25	12.5%	41	20.5%	66	33.0%
There are safeguards if the buyer fails to fulfil the agreement	33	16.5%	31	15.5%	64	32.0%
There are price premiums for delivering higher quality products	76	38.0%	109	54.5%	185	92.5%
Interest in case of delayed payments from the buyer	5	2.5%	5	2.5%	10	5.0%
Services like collection, storage, transport, handling, etc.	77	38.5%	104	52.0%	181	90.5%
Managerial support or technical assistance	53	26.5%	68	34.0%	121	60.5%
Credit assistance	3	1.5%	7	3.5%	10	5.0%
Special assets, technology and/or machinery	5	2.5%	2	1.0%	7	3.5%
Automatic extension of the agreement	57	28.5%	67	33.5%	124	62.0%

Regarding prices, during the period surveyed, on average farmers received 24.76 pence per litre (Table 22), which is quite low considering the average farm-gate price for milk in February 2018 was 29.64 (DEFRA), but in line with the average price for April 2016 to April 2017 (24.31 pence per litre). However, some farmers benefitted from very high farm-gate prices ranging from 37-41 pence per litre.

The way prices have been determined within the agreements is difficult to fully disentangle. Individual farm business prices are variable depending on the quantity and quality of the milk delivered, but also dependent on the market price at the point of collection/delivery. Collective organisation prices are also variable depending on quantity, quality and market prices, but they also depend on the shared profits of the collective organisation. In order to verify if participation in agreements with collective rather than individual organisations is associated with price differentials, the differences in prices between collective and individual organisations have been evaluated with a *t*-test, but no statistical significance was found. Therefore, differences in prices do not seem to be associated to the type of buyer.

Farmers were also asked about milk production costs, expressed as a percentage of milk prices (Table 23). On average production costs are 81.7% of prices, but in some circumstances production costs can be 140% of prices. For these farms profits might have been negative during 2016/17. The difference in costs between collective and individual organisations was also tested with a *t*-test, which was statistically significant (**=5% level of significance), suggesting that, on average, costs for farmers selling to individual businesses are 7.2% lower.

Table 23. Milk prices and production costs

Prices (£/l)	Mean	Min	Max
All farms	0.2476	0.18	0.41
Collective	0.2487	0.18	0.41
Individual	0.2468	0.18	0.37
Price difference (t-test)			
Collective-Individual	0.0019		
Costs (Price %)			
All farms	0.8172	0.01	1.4
Collective	0.8592	0.22	1.4
Individual	0.7874	0.01	1.4
Cost difference (t-test)			
Collective-Individual	0.072**		

The difference in production costs can be partially explained by the fact that farmers selling to collective organisations face costs associated with logistics, marketing, commissions on sales and quality testing more frequently than those selling to individual businesses (Table 24). Specifically, logistical costs affect 73.5% of farmers selling to collective organisations, compared to 51.3% of those selling to individual businesses.

Table 24. Different types of costs associated with sale agreement

Costs of agreement	Collective		Individual		All farms	
	N.	%	N.	%	N.	%
Membership fee	33	39.8%	36	30.8%	69	34.5%
Logistics	61	73.5%	60	51.3%	121	60.5%
Marketing	26	31.3%	13	11.1%	39	19.5%
Commissions	6	7.2%	7	6.0%	13	6.5%
Quality tests	34	41.0%	44	37.6%	78	39.0%

In addition, sale agreements require a variety of standards and certification, which can also affect costs. Almost all dairy farmers surveyed in Somerset and Devon have to satisfy minimum quality, food safety and animal welfare standards, either if they sell to collective or individual organisations (Table 25). In addition, standards on climate change mitigation and adaptation (CO2 footprint, zero km, etc...) were adopted by 51.8% of sellers to collective organisations, while standards on natural resource conservation (organic production, integrated pest management, conservation agriculture, no- or minimum-tillage, biodiversity, etc...) were adopted by 55.6% of sellers to individual businesses. Interestingly, standards on milk produced without the use of Genetically Modified Organisms (i.e. GM-free) were adopted by about one out of four farms, and particularly by sellers to collective organisations (28.9%). Moreover, the UK based assurance scheme Red Tractor was more frequently adopted by sellers to collective organisations (14.5%) rather than sellers to individual businesses (6%).

Table 25. Private standards adopted by dairy farms in the sample

Standard	Collective		Individual		All farms	
	N.	%	N.	%	N.	%
Standards on the quality of the final product	79	95.2%	108	92.3%	187	93.5%
Standards on food safety and hygiene	82	98.8%	116	99.1%	198	99.0%
Standards on natural resources and nature conservation	41	49.4%	65	55.6%	106	53.0%
Standards on animal welfare	81	97.6%	115	98.3%	196	98.0%
Standards on mitigation and adaption to climate change	43	51.8%	54	46.2%	97	48.5%
Genetically Modified free	24	28.9%	25	21.4%	49	24.5%
Red Tractor	12	14.5%	7	6.0%	19	9.5%

Finally, farmers were asked about their level of overall satisfaction with the agreement for their main sale, indicating satisfaction on a scale from 1 (completely unsatisfied) to 5 (completely satisfied). In addition, they were also presented with statements about what they might like/dislike of the agreement, again on a scale from 1 (strongly disagree) to 5 (strongly agree). Results are shown in Figure 41 and the threshold value is 3.

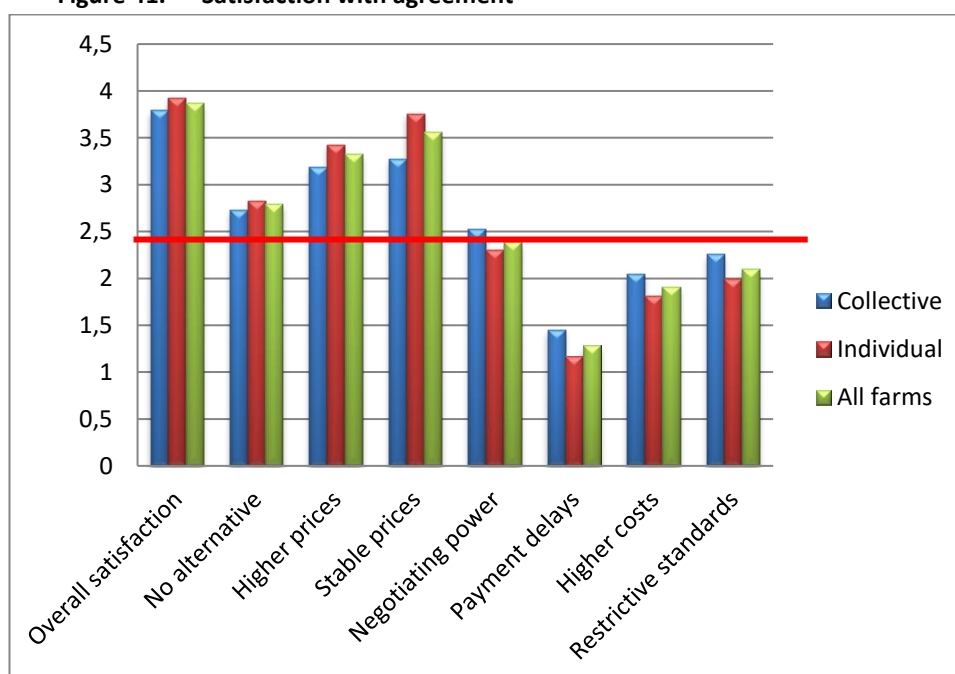
Overall, all farmers were quite satisfied with the agreement they have for their main milk sale, with an average answer close to 4. Farmers selling to individual businesses were particularly satisfied.

The reason for such a high level of satisfaction seems to be linked to the fact that the agreements guarantee higher prices and, even more important, that prices were fairly stable, mitigating the risks of price volatility. This is particularly true for farmers selling to individual businesses which, on average, agreed to the statements *“This sale agreement provides higher prices than alternative buyers”* and *“This sale agreement provides more stable prices from year to year than alternative buyers”*.

Problems related to excessive production costs and restrictive standards were not signalled as particular reasons for dissatisfaction. The surveyed farmers disagreed to the statements *“The costs associated with this sale agreement are too high”* and *“The production/quality standards required are too restrictive”*.

However, on average farmers also disagreed with the statement *“This sale agreement provides more possibilities for negotiating prices”*, suggesting that they do not have a strong negotiating position in the sales agreement.

Figure 41. Satisfaction with agreement



6.4 Dairy farmers' perceptions of the sustainability of sales agreements

One key objective of the survey was to gather information about how farmers perceive the sale agreements they have in place in terms of sustainability. Therefore, farmers were asked to assign a score from 1 (strongly disagree) to 5 (strongly agree) regarding the potential impact to sustainability of the sale agreement.

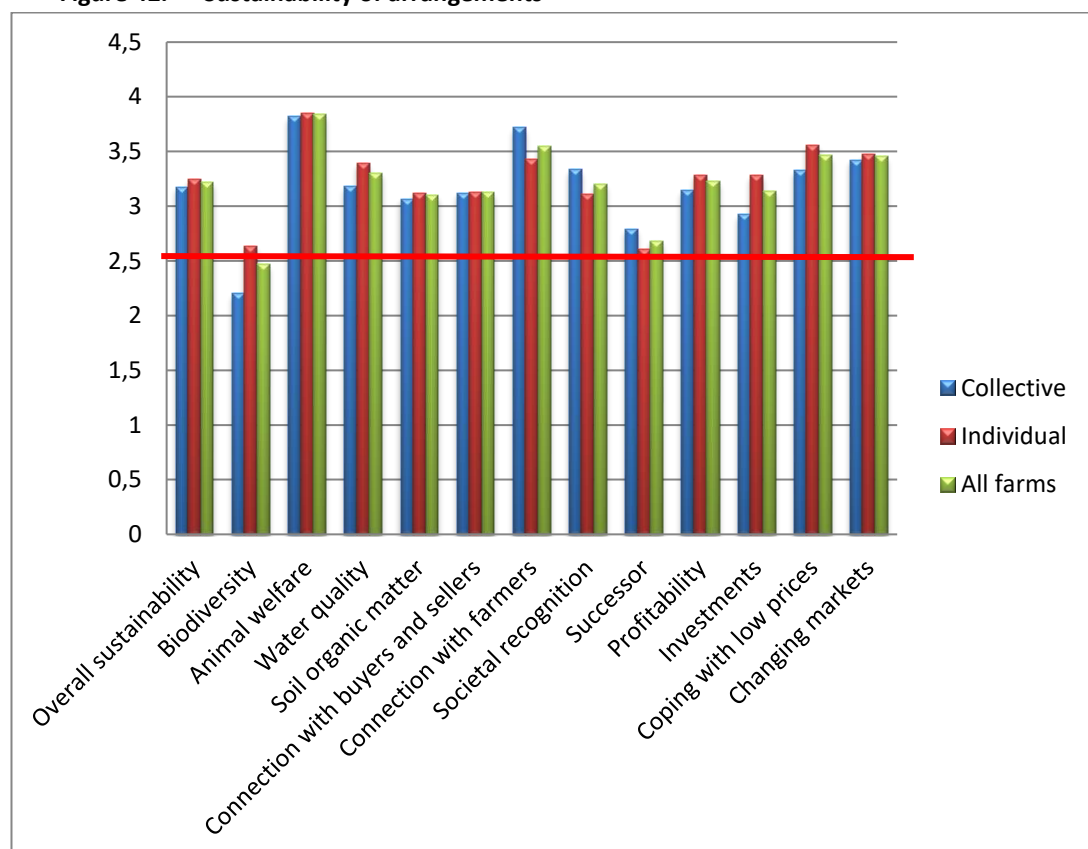
More specifically, with respect to three groups of sustainability indicators (environmental, social and economic sustainability), farmers were asked to assign a score on the following statement *“The production choices you made in relation to your main sale agreement/membership in collective organization helped you to:”*

1. Environmental sustainability

- a. Maintain biodiversity
 - b. Support animal welfare
 - c. Maintain water quality
 - d. Maintain soil organic matter
2. Social sustainability
 - a. Create a good connection with buyers and input providers
 - b. Connect with other farmers
 - c. Achieve societal recognition of your farming activities
 - d. Secure a successor
3. Economic sustainability
 - a. Maintain profitability
 - b. Invest in the farm business
 - c. Sell the products in periods of greater difficulty where prices were low
 - d. Cope with changing market conditions

The results are shown in Figure 42. On average, the overall sustainability of the arrangements is just above the threshold 3, for both arrangements with collective and individual organisations.

Figure 42. Sustainability of arrangements



Looking at the green column in Figure 42 (All farms), animal welfare was the strongest driver of environmental sustainability, while connection with other farmers was the strongest driver of social sustainability. Coping with low prices and changing markets were the two main drivers for economic sustainability.

Some important differences can be observed between sales agreements with collective and individual organisations. Farmers selling to collective organisations perceive their arrangements

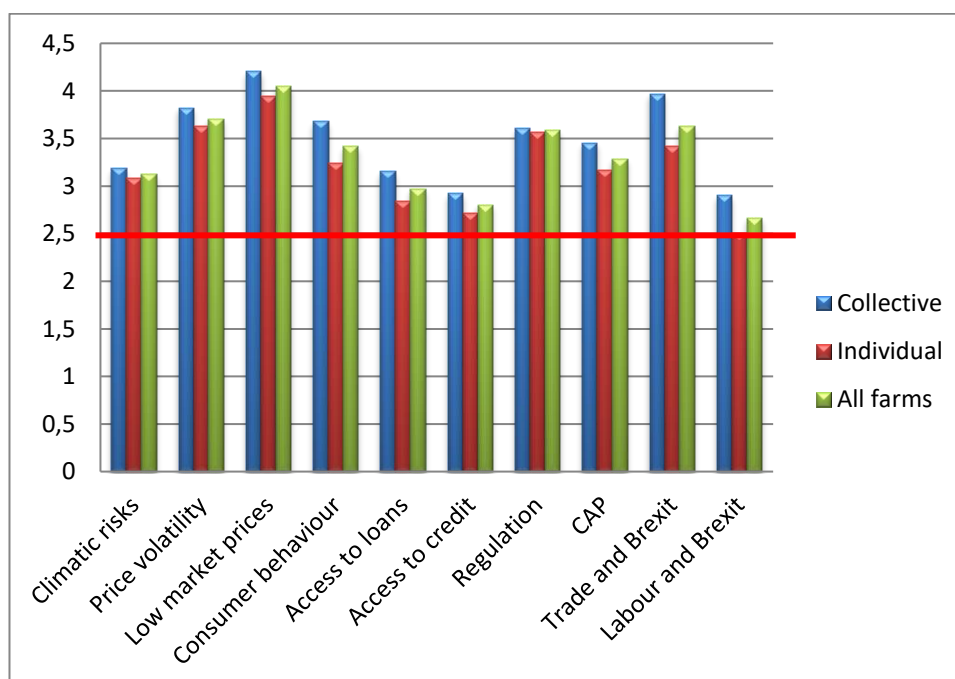
more sustainable in terms of connections with other farmers and societal recognition. This suggests that the arrangements with collective organizations were perceived as particularly sustainable from a social point of view. On the contrary, farmers selling to individual businesses perceived their arrangements more sustainable in terms of water quality, profitability, investments, coping with low prices and changing markets. Therefore, arrangements with individual businesses were perceived as particularly sustainable from an economic point of view.

6.5 Drivers and future farming strategies

The focus of the survey was on producers' sales agreements with buyers; however, additional questions regarding future farming strategies and the drivers of potential farming changes were also asked.

Initially farmers were asked to indicate how a series of environmental, policy and market factors were likely to influence their future decisions regarding production and farming strategies for milk, assigning a score from 1 (not at all) to 5 (strongly influenced). Results are shown in Figure 43.

Figure 43. Future drivers for dairy farming



On average, all farms (green column) individuate low market prices and price volatility as key drivers of dairy farming production strategies, underlying the importance of market uncertainties for this sector and the dominance of market factors in farmer thinking.

For the UK, the future of policies is greatly dominated by what will happen after Brexit. The potential outcomes of Brexit for agricultural policies are still largely unknown as the UK is still in a negotiating phase with the EU. However, from data collected in other work tasks, especially Tasks 2.4 and 2.5, it was clear that the main concerns of dairy farmers respecting Brexit were linked to future trade opportunities and the availability of workforce, especially seasonal workers from EU countries.

Results in figure X show that dairy farmers in Somerset and Devon consider potential trade issues linked to Brexit to be much more critical than labour issues in relation to future milk production strategies. This was of particular concern to farmers selling to collective organisations.

On average, farmers selling to collective organisations have stronger opinions with respect to farming drivers, as their scores were higher for a number of factors. Notably, a relatively large difference was observable between collective and individual channels with respect to the influence of consumer behaviour.

In the light of potential drivers of future dairy farming strategies, producers were also asked about what changes to their dairy farm business they expect to implement in the coming 5 years. Results are shown in Table 26.

Table 26. Expected farming strategies for the next 5 years

Strategy for the next 5 years	Collective		Individual		All farms	
	N.	%	N.	%	N.	%
Maintain the existing scale of operations	37	44.6%	70	59.8%	107	53.5%
Expand the scale of operations	31	37.3%	32	27.4%	63	31.5%
Downscale the scale of operations	4	4.8%	5	4.3%	9	4.5%
Abandon farming	7	8.4%	6	5.1%	13	6.5%
I do not know	4	4.8%	4	3.4%	8	4.0%

The majority of dairy farms (53.5%) do not have particular strategies in mind and they expect to maintain their existing scales of operation; with trend was consistent regarding both farmers selling to collective (44.6%) and individual organisations (59.8%). Interestingly, in the sample 6.5% of farms expected to abandon the sector. This percentage increased to 8.4% for farmers selling to collective organisations, which is relatively high, suggesting that in the coming years a number of farms may exit the UK dairy sector.

More details on what production or market changes were planned by surveyed farmers in the coming 5 years are provided in Table 27.

Among farmers with sale agreements with collective organisations, those who expect to maintain the current scale of operation planned to increase in productive investments anyway. Moreover, these farmers were planning to adopt new sales channels and to increase the added value of their milk (e.g. conversion to organic).

Increasing investments in production facilities was also a popular strategy, indicated by 34.7% of farmers selling to collective organisations which were planning to expand the operations scale, combined with 19.4% who planned to increase farming specialisation. In terms of market strategies, farmers selling to collective organisations and willing to expand, planned to develop new partnerships (for instance with other producers, retailers, processors) and add value.

Regarding farmers who foresee a downscale of operations and were selling to collective organizations, their plans focused mainly on production specialization and new sales channels (4.2% each).

Moving to farmers selling to individual businesses, table x shows that 19.6% of those expecting to maintain their current scale of operations were planning additional productive investments, 11.2% planned to externalise part of the production activities as well as insure crops or livestock and 10.3% to buy income insurance.

Finally, the main production changes planned by farmers selling to individual businesses willing to expand their operations scale were related to productive investments (21.5%), specialisation (14%) and income insurance (7.5%).

Table 27. Farming strategies planning in the next 5 years

		COLLECTIVE				INDIVIDUAL			
		Maintain	Expand	Downscale	Total	Maintain	Expand	Downscale	Total
Production changes									
	Investements	13.9%	34.7%	1.4%	50.0%	19.6%	21.5%	0.0%	41.1%
	Externalise	9.7%	15.3%	1.4%	26.4%	11.2%	7.5%	0.9%	19.6%
	Specialise	6.9%	19.4%	4.2%	30.6%	9.3%	14.0%	1.9%	25.2%
	Crop/livestock insurance	4.2%	12.5%	1.4%	18.1%	11.2%	11.2%	0.0%	22.4%
	No plans	1.4%	4.2%	0.0%	5.6%	5.6%	0.9%	1.9%	8.4%
	Other	0.0%	5.6%	1.4%	6.9%	5.6%	3.7%	2.8%	12.1%
Market changes									
	Diversification	1.4%	5.6%	2.8%	9.7%	4.7%	3.7%	1.9%	10.3%
	Income insurance	1.4%	4.2%	0.0%	5.6%	10.3%	7.5%	0.9%	18.7%
	New partnership	5.6%	9.7%	2.8%	18.1%	3.7%	5.6%	1.9%	11.2%
	New sale channels	6.9%	5.6%	4.2%	16.7%	4.7%	5.6%	0.9%	11.2%
	Add value	6.9%	11.1%	1.4%	19.4%	5.6%	5.6%	1.9%	13.1%
	No plans	4.2%	0.0%	0.0%	4.2%	2.8%	0.9%	0.0%	3.7%
	Other	2.8%	0.0%	0.0%	2.8%	0.9%	0.0%	0.0%	0.9%

6.6 Conclusions

The dairy sector is facing a number of challenges not only in the UK but also in the EU. These challenges are mainly related to the globalisation of the supply chain, which is linked to the volatility of global milk markets, and expected policy changes such as Brexit and the reform of the CAP in 2020.

In particular, the UK and EU dairy sectors recently moved from a strong intervention of milk supplies through the quota system, which influenced and balanced domestic prices, to a complete liberalisation of markets. After the removal of dairy quotas, milk supplies have been mainly regulated by the free market through a variety of old and new supply chain agreements between milk producers and buyers.

Moreover, at the EU level, new policies are strengthening the role of producer organisations in the food supply chain, such as the Omnibus Regulation, with the objective of increasing the share of value added generated in the food supply chain to farmers, by improving their bargaining power in their contractual negotiations with the food industry and retailers. All these aspects clearly indicate the importance of studying the nature of the commercial transactions and agreements occurring along the dairy supply chain, and in particular from a primary producer perspective given farmers place at the start of the supply chain.

This analysis has contributed to the debate by shedding light on what is happening in dairy supply chain agreements in two of the most important UK counties producing milk, Somerset and Devon. Survey results from a representative sample of dairy farmers in the two counties showed that dairy sales channels are dominated by cooperatives and processors/food industry actors as the main buyers of milk.

The most frequent features in the sales agreements concern sales exclusivity, price premiums for higher quality milk and collection, storage and transportation services. Almost all dairy farmers in Somerset and Devon have to satisfy minimum quality, food safety and animal welfare standards, either if they sell to collective or individual organisations. Overall, all farmers were quite satisfied with the agreement they have for their milk sales, and the reason for such satisfaction was linked to the fact that the agreements guaranteed higher market stability, mitigating the risks of price volatility.

The arrangements with collective organisations were perceived by farmers as particularly sustainable from a social point of view, allowing interactions and connections with other farmers or with other actors in the farming system. On the contrary, farmers selling to individual businesses highlighted the economic sustainability of their agreements, showing a higher business orientation. Despite satisfaction or potential sustainability of sale agreements, farmers were still facing very high production costs. For some farmers the cost of producing a litre of milk was higher than the price they received from a buyer, therefore for these farmers profits were either limited or, more probably, negative, running the business at loss.

The results and data presented in this analysis are highly valuable and more detailed analyses are planned using econometric methodologies, including more detailed analysis of the impact of supply chain arrangement attributes on farm prices and costs. The analysis of the impact of supply chain arrangements on farms' technical efficiency are also planned as part of the wider SUFISA project.

7 Conditions, Strategies, Performances: Inventory analysis of key trends identified across the two case studies

7.1 Introduction to the inventory

Primary producers across the UK dairy and fishing case studies are faced with a multitude of external and internal **conditions**. In response they have developed a range of **strategies** to enhance or sustain their socio-economic business **performance**. This section reports on the analysis of the conditions, strategies and performances characteristics of the case study producers, as collected in the SUFISA inventory.

A more detailed and holistics analysis of the inventory can be found in the 'SUFISA inventory report', but what follows here is the presentation of the key trends identified in relation to the UK dairy and fishing case studies.

7.2 Dairy

The issues affecting the UK dairy sector can be classified in the following five themes: milk price volatility, access to markets, environmental protection, recruitment and intergenerational succession, and Brexit, with the key trend being price volatility.

7.2.1 Key conditions

Table 28 lists the conditions identified within the dairy sector, ranked in order of the most to the least cited. For instance, price levels and volatility as a condition was cited 11 times, representing 37% all reported conditions for this commodity. Although all the conditions reported are salient to some extent to the commodity in the UK, some are more significantly discussed than others.

Table 28. Most cited conditions for dairy

Condition	Count	%
Price levels / volatility	11	37
Regulation and policy	7	23
Socio-demographic	3	10
Market access	3	10
Ecological / environmental	3	10
Demand	2	7
Factor access (land, labour, finance)	1	3
Total	30	100

Regulation and policy (23%) was the second most cited condition. This is understandable given the recent major policy transformations. First, that on the 1st April 2015, 30 years after they were established, dairy quotas were abolished. Second, Brexit is creating uncertainties amongst the farming community. Third, although the Conservative manifesto has guaranteed to match CAP payments until 2020, the situation is fragile since agreements with the European Union are still in negotiation.

Socio-demographic conditions (10%), involving intergenerational farm transfer and the recruitment of new entrants, are significant both for the sustainability and resilience of the UK dairy sector. Because of high start-up costs, familial succession is the most common form of transfer. Market access (10%) for UK dairy farmers is another important issue.

Ecological/environmental (10%) conditions are discussed in the CSP inventory in terms of the significant environmental impacts of dairy farming on Nitrate Vulnerable Zones (NVZs); as such, water quality measures can be particularly influential on dairy farming practices. There has been significant policy effort over many decades (direct payments linked to environmental sustainability rules and minimum environmental requirements); that said, environmental policy from the EU tends to be much criticised for its standardised and indiscriminate nature.

Demand (7%) conditions, although less discussed compared to the other conditions, is still important in terms of accessibility to emerging markets as European demand for milk plateaus. Similarly, factor access (3%) impacts dairy farmers, discussed in terms of access to land, most notably young farmers and/or new entrants who may be entirely priced out of the market.

7.2.2 Key strategies

Table 29 shows the diversity of strategies reported in the UK dairy case study. Overall, market orientated strategies prevail in the UK CSP inventory for milk. When the quota regime, viewed as a barrier to EU producers responding to growing global demand, was abolished, it implied that production should be based on market demand. The dairy industry was in a way expected to self-adjust the quantity of milk produced by monitoring and responding to market signals.

Table 29. Most cited strategies for dairy

Strategy	Count	%
Market orientation	5	17
Flexibility in production and marketing	3	10
Subsidies and grants	3	10
Training, advice and investment in research and development	3	10
Developing markets	2	7
Financial management	2	7
Collective arrangements	2	7
Intensification, specialisation, upscaling, changing crop focus	2	7
Lobby access	1	3
Reducing production costs	1	3
Succession planning	1	3
Diversifying income sources, both on- and off-farm	1	3
Technological innovation	1	3
Deliberate focus on environmental issues	1	3
Contractualisation	1	3
Informal arrangements	1	3
Total	30	100

In fact, dairy farmers are becoming increasingly sensitive to the fact that oversupply can contribute to a decrease in milk prices and the need to be flexible in terms of both production and marketing (10%): for example, adjusting butterfat content or converting to organic, in line with emerging market demands. Likewise, in terms of marketing: for instance, some ‘free range’

milk farmers are seeking formal recognition/certification for their farming system through the Pasture Promise logo (which guarantees that their cows are outside for a minimum of 180 days per year).

Despite these market-based initiatives, the milk sector in the UK is in crisis, in need of policy level support. Although dairy farmers rely on subsidies and grants less than farmers in other sectors, it does represent an increasing proportion of their Farm Business Income (FBI), especially in times of low milk prices. Strategies concerned with training, advice and investment in research and development were also discussed (10%).

At the business level, developing markets, financial management, collective arrangements and changes in production systems (through intensification, specialisation, upscaling, and changing crop focus for example) come next. A series of other strategies are mentioned, each relevant to particular circumstances.

This variety of strategies reported in the CSP inventory reflects the heterogeneous nature of the dairy sector. There cannot be one strategy to address all the issues faced by the sector. In fact, just as the removal of quota can be viewed either as a business opportunity or a risk factor, Brexit can be also be perceived an opportunity or threat, dependent on the farm business involved.

7.3 Fish

7.3.1 Key conditions

Table 30 lists the conditions within the inshore fisheries sector as reported in the case study in UK ranked in order of the most to the least cited. The counts represent how often each condition was cited. For instance, regulation and policy conditions were cited 11 times out of the 32 times, representing 34% all reported conditions for this commodity. Although all the conditions reported are salient to some extent to Cornish inshore fisheries, some are more significantly discussed than others.

Table 30. Most cited conditions for fisheries

Condition	Count	%
Regulation and policy	11	34
Market access	6	19
Ecological / environmental	5	16
Price levels / volatility	4	13
Factor access (land, labour, finance)	3	9
Socio-demographic	2	6
Demand	1	3
Total	32	100

Regulation and policy (34%) conditions significantly affect the operational aspects of inshore fisheries, particularly in relation to their flexibility in terms of what to catch and when. The Total Allowable Catch (TAC) is set each year by the Council of Fisheries Ministers, regulating fishing quotas. This restriction of the quantities, timings and species of fish that may be caught, significantly impact on the profitability of fishers. The pressures on flexibility in terms of what quota species may be caught has led many fishers to increase the number of quota-free shellfish

they catch. This implies that new markets need to be accessed, both domestically and internationally.

Market access issues (19%), and the related economic and market performance of the fisheries sector, is not only important to the fishers themselves, but also to the wider communities in which they operate, given that several regions depend on the tourist attraction small fishing ports represent.

Another priority issue concerns ecological / environmental conditions (16%) mainly in terms of marine protection. For many, fisheries management via the CFP fails to deliver sustainable fisheries. A lack of transparency and failure to include a wide range of stakeholders' perspectives are the main criticisms made. For many fishers, selling their fish at harbour-side provides a fair price but this can fluctuate considerably dependent on the season and the quantities of fish landed that day. The more fish landed, the lower the price received, so that price levels / volatility (13%) is an issue.

The issues of factor (land, labour, finance) access is discussed in terms of the monetisation of licences and quota, which were previously state-owned and have become privately owned. The limitation in numbers has increased their value and this has made it more difficult for new entrants to join the industry. Much less discussed, but still an issue, is the question of demand (3%), not least that eating fish is not a key part of British culture.

7.3.2 Key strategies

Today, the inshore fishing sector is not only about catching fish. To survive in the face of the multiple challenges mentioned, fishers have to devise a wide range of strategies to ensure they earn a living, stay in business and make a profit. This is reflected in the strategies listed in Table 31, below.

Table 31. Most cited strategies for fisheries

Strategy	Count	%
Market orientation	8	25
Training, advice and investment in research and development	4	13
Deliberate focus on environmental issues	4	13
Developing markets	3	9
Succession planning	2	6
Intensification, specialisation, upscaling, changing crop focus	2	6
Flexibility in production and marketing	2	6
Collective arrangements	2	6
Technological innovation	1	3
Lobby access	1	3
Informal arrangements	1	3
Extensification, downsizing or abandonment	1	3
Contractualisation	1	3
	32	100

Given the market access issues and regulatory barriers and constraints perceived, expressed and experienced by many fishers, it is logical that the three key strategies are market, policy and development focused. The data analysis shows that market orientation (25%) strategies are

discussed in relation to the following conditions: market access, price levels and volatility, regulation and policy. Although, fishers are highly independent, and there is a reticence to work together and to share information about where to catch, or where to market them, some fishers are working together to reduce their costs and improve the prices they receive. Second most noted strategies concern training, advice and investment in research and development (13%) and a deliberate focus on environmental issues (13%). The inshore fishing sector is concerned with succession since there is lack of new fishers. Several training schemes have been put in place but are largely seen as 'hurdles without meaning' which cannot replace actual fishing experience.

The sector's sustainability depends economically on accessing new markets, and on the long-term availability of marine resources. Some fishers are turning to processing as well as investing in direct marketing. Added value is a key aspect of many strategies which seek to differentiate fishing businesses from each other and thereby earn a better price on their products. In this respect, improved information and communication improves their ability to be more effective.

7.4 Inventory – final remarks

This final table below (Table 32) shows the relationship between the indicators of expected performance for each of the two sectors, in relation to the strategies undertaken. The darker the shading the more significant in terms of desired performance outcomes and related strategies. What the table shows is that in both sectors developing strategies to enable or enhance business resilience is the main priority. This reflects the general finding across both case studies that dairy farmers and fishers often look first to reduce costs and make changes at the production level in response to external shocks. In dairy improving financial stability is the other priority, linked to the on-going issues associated with volatility and market uncertainty. Strategies to improve profitability, market access and environmental sustainability were noted in the UK fishers CSP data.

Table 32. Strategies & expected performance indicators – fishing & dairy

Indicators and percentage frequency	Strategies	
	Dairy	Fisheries
Enhanced farm/business resilience Dairy: 23% Fisheries: 23%	Market orientation Collective arrangements Financial management Flexibility in production and marketing Training, advice and investment in research and development Contractualisation Developing markets Diversifying income sources, both on- and off-farm Informal arrangements Reducing production costs Succession planning Technological innovation	Market orientation Training, advice and investment in research and development Flexibility in production and marketing Succession planning Contractualisation Developing markets Extensification, downsizing or abandonment Informal arrangements Intensification, specialisation, upscaling, changing crop focus
Greater financial stability Dairy: 22% Fisheries: 9%	Market orientation Flexibility in production and marketing Subsidies and grants Collective arrangements Contractualisation Developing markets Diversifying income sources, both on- and off-farm Financial management Informal arrangements Intensification, specialisation, upscaling, changing crop focus Reducing production costs Succession planning Technological innovation Training, advice and investment in research and development	Market orientation Collective arrangements Extensification, downsizing or abandonment Flexibility in production and marketing Intensification, specialisation, upscaling, changing crop focus Training, advice and investment in research and development
Greater profitability Dairy: 14% Fisheries: 15%	Market orientation Intensification, specialisation, upscaling, changing crop focus Contractualisation Diversifying income sources, both on- and off-farm Financial management Reducing production costs Subsidies and grants Technological innovation	Market orientation Intensification, specialisation, upscaling, changing crop focus Informal arrangements Flexibility in production and marketing Developing markets Contractualisation Collective arrangements
Added Value Dairy: 4% Fisheries: 9%	Flexibility in production and marketing Market orientation Diversifying income sources, both on- and off-farm	Market orientation Collective arrangements Developing markets Informal arrangements
Improved access to markets Dairy: 9% Fisheries: 14%	Market orientation Developing markets Flexibility in production and marketing Collective arrangements	Market orientation Developing markets Collective arrangements Training, advice and investment in research and development
Strengthened negotiation power Dairy: 6% Fisheries: 3%	Collective arrangements Market orientation Informal arrangements Lobby access	Market orientation Lobby access
Increased productivity Dairy: 5% Fisheries: 4%	Intensification, specialisation, upscaling, changing crop focus Market orientation Technological innovation	Flexibility in production and marketing Intensification, specialisation, upscaling, changing crop focus
Social benefits Dairy: 6% Fisheries: 3%	Subsidies and grants Training, advice and investment in research and development Succession planning Informal arrangements Collective arrangements	Training, advice and investment in research and development Informal arrangements
Environmental benefits Dairy: 3% Fisheries: 14%	Training, advice and investment in research and development Subsidies and grants Deliberate focus on environmental issues	Deliberate focus on environmental issues Developing markets Flexibility in production and marketing Market orientation Technological innovation Training, advice and investment in research and development

Indicators and percentage frequency	Strategies	
	Dairy	Fisheries
Improved information and communication Dairy: 6% Fisheries: 7%	Training, advice and investment in research and development Lobby access Informal arrangements Developing markets Collective arrangements	Developing markets Informal arrangements Market orientation Training, advice and investment in research and development

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8.4 Appendices

8.4.1 Appendix 1: Inshore fishing interviewees

Organisation	Role
1. Cornish Fish Producers' Organisation (CFPO)	[Producer organisation] Assistant to CFPO chief executive
2. Marine Management Organisation (MMO)	[Regulations and policy] Senior Marine Enforcement Officer
3. Cornwall Inshore Fisheries and Conservation Authority (IFCA)	[Regulations and policy] Principal enforcement officer
4. Cornwall Development Company (CDC)	[Wider economic development, including markets]
5. Cornwall Rural Community Charity (CRCC)	[Deliverers of Cornwall and Isles of Scilly FLAG] Rural Development Manager
6. South West Handline Fishermen Association (SWHFA)	[Small-scale fishing association]
7. Natural England - Truro	[Broad environmental perspective] Marine Senior Advisor
8. Cornwall Wildlife Trust	[Wildlife perspective] Marine Awareness Officer, Marine Team
9. National Lobster Hatchery	[Marine ecology/environment] Research post-doc
10. Centre for Environment, Fisheries and Aquaculture Science (CEFAS)	[Marine science organisation]
11. Wing of St Maws	[Fish Merchant]
12. Barclays Bank Plc, Cornwall	[Business Manager Barclays Business – Cornwall]
13. Plymouth Trawler Agents Ltd.	[Run the Plymouth fish market]
14. Sutton Harbour, Plymouth harbour master	[Plymouth Fisheries at Sutton Harbour]
15. Newlyn harbour master	[Harbour master]
16. Looe harbour master	[Harbour master]
17. Mevagissey harbour master	[Harbour master]

8.4.2 Appendix 2: Inshore fishing focus group summary data

Site of FG	Code Name	Age group				Employee nt		Fishing strategy										Household Information							
		<25	25-45	45-65	>65	FT	PT	Port/ Harbour fished out of	Size of your boat (metres)	Single-handed	Crew	Type of gear	Types of fish	Approx. annual catch (kg)	Approximate value of annual catch/£				Approximate % of household income from fishing	Number of people in household	Family members working in fishing industry			Other sources of income	
															<20000	20001-50000	50001-100000	>100000			Y/N	Who	Capacity		
St Martins/ Helford [SM]	SM 1			1		Y		Cadgwith	7.62	N	1	2 3/4 to 10 ½	All species	na			Y		100	4	Y	Stepson	Crew	Spouse working	
	SM 2			1		Y		Cadgwith	7.80	N	1	Nets and Pots	Monk, Red mullet, Ray, Crab, Lobster, craws	na				Y	90	5	Y	Two sons	1 Fulltime an 1 part-time	Spouse Teacher	
	SM 3			1		Y		Helford	8.54	N	2	Nets and Pots	Crab, whitefish	na	na	na	na	na	100	5	Y	1 son	na	Na	
	SM 4		1			Y		Helford	8.23	Y	-	Tangle Nets and gill nets	Monkfish, ray, Cod, Turbo, Brill	15000		Y			100	2	N	0	0	0	
	SM 5				1		Y	Falmouth	5.49	Y	-	Handline, pots, nets, gill tangle	Mackerel pollock, ray, monk	na	Y				20	1	N	na	na	Legal work/ Renting property	
	SM 6				1	Y		Helford	na	na	na	na	na	na	na	na	na	na	na	na	na	Y	na	na	na
Newlyn [NL]	NL 1				1	Y		Newlyn, Plymouth, Brixham	14.0	N	3	Twin Rig	Demersal	25000				500k	15	5	4	Family	na	Retired but still owns a boat	
	NL 2			1		Y		Newlyn	5.79	Y	-	Pots	Crab, Lobster	3000		Y			50	2	N	-	-	Spouse working	
	NL 3		1			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Padstow [PW]	PW 1		1			Y		Padstow	7.80	Y	-	Pots	Lobster, crab, spider crab	25000			Y		100	4	3	Uncle FT; Brother PT; cousin FT	na	Spouse works at Exeter University	
	PW 2			1		Y		Padstow	6.50	Y	-	Pots lines and	Shellfish, bass, pollock	10-15000			Y		70	3	Y	Son	17m gill netter crew	Spouse working	
	PW 3		1			Y		Padstow	9.76	N	1	Pots	Crabs, lobster, crawfish, spider crab	35000			Y		na	4	na	na	na	Partner is beauty therapist	

(na means not available)

8.4.3 Appendix 3: Inshore fishing focus group schedule

Introduction: Can each of you please tell us your name, how you got into fishing and why you go fishing.

First discussion theme: What are the main policy and regulatory conditions that are an issue for you / for the inshore fishing industry in Cornwall?

Participants were prompted in relation to the following issues: Access to quota; Latent capacity; Management of non-quota species; Landings obligation / discards ban; Environmental regulations; and the implications of Brexit

Second discussion theme: Markets and marketing

Participants were prompted in relation to the following issues: What are the key issues in terms of selling your catch? Where do you sell your catch? Collaboration? What are the implications of the landings obligation, in terms of marketing? Adding value; Certification; and Brexit.

Third discussion theme: Finance

Participants were prompted in relation to the following issues: What are the main issues gaining access to finance? What sources of finance are available? Does a lack of finance constrain your business opportunities?

Fourth discussion theme: Recruitment, succession and social issues

Participants were prompted in relation to the following issues: What are the key issues constraining people coming into fishing? What might encourage more people to come into fishing? Do you want your children to go into fishing? Will Brexit affect the availability of foreign labour?

Fifth discussion theme: Adaptive strategies undertaken

Participants were prompted in relation to the following issues: Going part-time, single-handed, adding value, leaving fishing etc; to what extent is their adaptive capacity related to flexibility? What risk management strategies are available?

In conclusion: Looking to the future of inshore fishing in Cornwall

Participants were prompted in relation to the following issues: how might greater flexibility be enabled? Any final thoughts on the future of inshore fishing in Cornwall?



SUFISA Workshop – Cornwall Inshore Fishery

Wednesday 22nd March 2017 10.30 – 15.00

Venue:

Brian Etherington Meat Co. – Corporate and Conferences
Wheal Rose
Scorrier
Redruth TR16 5DF

<https://www.visitcornwall.com/brian-etherington-meat-co-corporate-conferences>

Agenda

10.30 – 11.00	Arrival, tea and coffee
11.00 – 11.10 (10 mins)	Brief round of introductions
11.10 – 11.15 (5 mins)	Aims of the meeting
11.15 – 11.30 (15 mins)	Brief introduction to the SUFISA project / Points of clarification
11.30 – 11.50 (20 mins)	Presentation of work to date / key findings
11.50 – 12.45 (55 mins)	Discussion of work to date / stakeholder feedback
12.45 – 13.30 (45 mins)	Buffet lunch
13.30 – 14.45 (75 mins)	Debating future scenarios, following Brexit
14.45 – 15.00 (15 mins)	Conclusions and next steps – Delphi and reporting



SUFISA: Sustainable finance for
sustainable agriculture and
fisheries
Grant agreement no: 635577



8.4.5 Appendix 5: Inshore fishing workshop attendees

Organisation	Role
1. Marine Management Organisation (MMO)	Senior Marine Enforcement Officer
2. Cornwall Inshore Fisheries and Conservation Authority (IFCA)	Principal enforcement officer
3. South West Handline Fishermen Association (SWHFA)	[Small-scale fishing association]
4. Natural England - Truro	Senior Marine Advisor
5. Cornwall Wildlife Trust	Marine Awareness Officer, Marine Team
6. CCRI, University of Gloucestershire	Dr James Kirwan – senior researcher
7. CCRI, University of Gloucestershire	Dr Damian Maye - senior researcher
8. CCRI, University of Gloucestershire	Dr Hannah Chiswell – research assistant
9. CCRI, University of Gloucestershire	Ms Dilshaad Bundhoo – research assistant

8.4.6 Appendix 6: Cornwall Inshore Fishery – looking to the future

Stake-holders	What are your <u>priorities</u> in relation to Cornwall's inshore fishery over the next five years?	How will these be best <u>achieved</u> ?	What will be the key <u>challenges/uncertainties</u> in relation to Cornwall's Inshore fishery, both during the negotiations and after Brexit?
S1	<p>Natural England (NE) wants to see a thriving, sustainable and viable inshore fishery in Cornwall in the next 5 years</p> <p>-MPA designation is/will have an impact on inshore fisheries in certain MPAs</p> <p>NE would wish to work with:</p> <ul style="list-style-type: none"> - industry, regulators and Defra to help minimize impacts where possible. - FLAG to advise on the best use of £810k over the remaining 2 years to ensure /help with the goal of a viable and sustainable inshore fishery. 	<ul style="list-style-type: none"> - Working with lay partners/sea users and industry to provide advice and work to positive environmental outcomes which can be win-win - Help advise on where there are risks to the area of habitats /species in MPAs and protected species - Help overcome and find solutions to these issues. - Adaptive risk management i.e. best and most achievable management solutions and adaptation as new evidence and information comes to light. 	<ul style="list-style-type: none"> -Access to EU markets for inshore fleet -Continuing with succession/intake to the industry -How access to foreign vessels/ historic rights will be governed in the inshore sector? -How quotas for inshore versus offshore fleets will continue to be managed? -How MPAs will be managed by UK government and in particular in areas which involve other nations i.e. cross border sites and with 'foreign' vessels?
S2	<ul style="list-style-type: none"> -Sustainable exploitation of sea fisheries resources -Viable fishing industry -Catches of fish which do not exceed market demand -Diverse fisheries -Measures taken to reduce discards of marketable fish 	<ul style="list-style-type: none"> - Suitable management through fisheries legislation - Cooperative working by fishermen - Codes of Conduct (100% agreement required) - Correct balance of fishing activities against impacts on the marine environment. 	<ul style="list-style-type: none"> -EU-CFP not fit for purpose -Defra -particularly while UK is part of EU -Environmental concerns -Access to export markets
S3	<ul style="list-style-type: none"> -Enforce fisheries legislation -Buyers and Sellers registration, encourage more registration -Under 10 recording of catches/ logbooks -MPA enforcement increasing 	<ul style="list-style-type: none"> -Coastal visits --->desktop enforcement -Inspections ---->desktop enforcements -Use of new technology, i.e. apps -Use of new vessel monitoring for smaller vessel <10m ability to use geofencing 	<ul style="list-style-type: none"> -Possible falling fish prices post Brexit -Nervousness of industry -More flexibility post Brexit to introduce new systems, but possibly less funding available -New hardware required but less (eco) funding
S4	<ul style="list-style-type: none"> -Sensible changes in management post Brexit -Adequate scientific monitoring of stocks and fishing input to include species of commercial importance such as Monkfish, Megrim, cuttlefish and scallops -Improving local markets for Cornish fish -Rewarding sustainable fishing and encouraging improved practice. e.g. use of pingers in inshore gill net fishing -Encouraging new fishermen -Get rid of tradable licence and Quota 	<ul style="list-style-type: none"> -In the hands of government and IFCAs -Pressure on government -Presentation of CGSG -Getting supermarkets on board -Sensible legislation 	<ul style="list-style-type: none"> -What will happen? Catches need to be limited to prevent over fishing, but discarding needs to be eliminated -Cooperation with EU to ensure stocks don't get overfished by our neighbours
S5	<ol style="list-style-type: none"> 1) Ideally take over all the waters: international to the middle of the channel: via UNCLOS to 200 mile zone 2) Abandon the London fisheries convention so that UK has sole access to the 6-12 mile band. 3) The UK must have sufficient quotas to make fishing viable and avoid discarding large amounts of fish. 	<ol style="list-style-type: none"> 1) By way of UNCLOS 2) By abandoning /getting rid of the French vessels. Initially this was fished by small powered trawlers. Up to 12/20 French vessels fish in this area 	<p>Challenges to improve the lot of British Fishermen, so that we have a level playing field with other EU countries.</p>

8.4.7 Appendix 7: Dairy interviewees

Organisation	Role
1. National Farmers' Union (NFU) Somerset	Somerset County Chairman and farm business consultant
2. Agriculture and Horticulture Development Board (AHDB)	[Levy Board] Knowledge Exchange Officer for South West England
3. NFU Dairy Board	South West England Dairy Board Chairman and dairy farmer
4. Tenant Farmers Association	South West England Chairman
5. Triodos Bank	Lending Manager
6. Somerset Young Farmers Club	Rural Affairs Chairman
7. West Of England Rural Network	[Local Action Group] Programme Manager, LEADER
8. Yeo Valley	[Major organic processor] Procurement manager
9. The Soil Association	[Main UK organic certification body] Farm Business/Supply Chain Technical Advisor
10. Lloyds Bank	Area Director Agriculture, Somerset and East Devon
11. Barclays Bank	South West England Regional Manager, Agriculture
12. Dairy UK	[Trade association, UK dairy] Policy and Sustainability Director
13. British Cattle Veterinary Association (BCVA)	BCVA board member and dairy/vet consultant

8.4.8 Appendix 8: Dairy focus group summary data

Table 1/2

Site of FG	Code Name	Age group				Employ-ment status		Status on the Farm			Household Information						
		<25	25-45	45-65	>65	FT	PT	Farmer	Farm Manager	Other	Size of farm (Acres)	Approximate % of household income from farming	Number of people in household	Family members wokring in fishing industry			Other sources of income
														Y/N	Who?	Capacity	
Sedgemoore	S1			Y		Y		Y			140	100	2	Y	wife	farming partner	-
	S2		Y			Y		Y			400	50	2	Y	parents	Farming	wife full time teacher
	S3				Y		Y			Director	1100	0	1	Y		Associated business	penion
	S4			Y		Y		Y			160	95	5	Y	wife	Full-time	wind turbines and house rents
Coombe	S5			Y		Y			Y		1300	70	4	none	-	-	30% Spouse income
	S6	Y				Y		na	na	na	na	na	na	na	na	na	na

(na means not available)

Table 2/2

Site of FG	Code Name	Farm characteristics											
		Size of farm (Acres)	Number of workers	Size of herd	Average milk yields (litres of milk per cow per annum)	Types of final product	Land - owner	Tenanted-farmer	Approximate value of annual output/£				Diversification
									<50000	50000-100000	100001-250000	>250000	
Sedgemoore	S1	140	0	100	6100	milk, beef, calves	Y	Y			Y		Solar panels
	S2	400	3	270	7000	liquid Milk	Y	Y				Y	Beef, cattle, solar panels
	S3	1100	7	700	7700	yogurt	Y	N				Y	Solar panels 1/2 acre
	S4	160	2	160	8500	liquid Milk, heifers, calves, burreners	Y	N				Y	Wind turbines, house rents
Coombe	S5	1300	6	270	6700	60% liquid; 25% Brie; 15% Cheddar	Y	Y				Y	None
	S6	na	na	na	na	na	na	na	na	na	na	na	na

(na means not available)

8.4.9 Appendix 9: Dairy focus group schedule (key themes)

Welcome to the focus group/introduce SUFISA project/aims of the meeting.

Introduction: [5-10 minutes]

By way of **an introduction** can each of you please tell us your name and introduce your dairy farm. If I might start with you...

First discussion theme: [20 minutes]

Markets for milk

Where do you sell your milk?

What are the key issues in terms of selling your milk?

Brexit

Second discussion theme: [15 minutes]

Milk prices and price volatility

Third discussion theme: [20 minutes]

Marketing strategies and standards

Contractualisation and A&B pricing (vertical co-ordination)

Producer organisations and collaboration (horizontal co-ordination)

Standards (vertical)

Adding value, organic production and alternative markets (vertical)

Fourth discussion theme: [25 min.] Policy & regulatory conditions / strategies

- **What are the main policy and regulatory conditions that are an issue for you / for the dairy sector in Somerset?**

Policy support (public co-ordination)

Abolition of milk quota (public co-ordination)

Milk Marketing Boards (public)

TB regulations

Environmental regulations

Implications of Brexit

Fifth discussion theme: [15 minutes]

Adaptive strategies undertaken – Buffer / Adaptive / Transformative

- To what extent is your adaptive capacity related to flexibility?

Sixth discussion theme: [10 minutes]

Finance

Seventh discussion theme: [15 minutes]

Recruitment, succession and social issues

In conclusion: [5 minutes]

Looking to the future of dairy farming in Somerset / your business

8.4.10 Appendix 10: Additional dairy interviewees

Organisation	Role
1. Barber's	[Farmhouse cheesemakers] Milk supply manager
2. Free Range Dairy Network	[Community Interest Company (CIC)] Founder & Director
3. Wyke Farms	[Largest independent producer of cheese in the UK] Milk buyer and farm liason officer
4. Coombe Farm Milk Pool	Director and farm liason officer
5. Crediton Dairy	[UK's leading dairy drinks businesses] Head of Milk Supply
6. Arla Foods	[International cooperative and large producer of dairy products] Board of Representatives
7. Horrington Milk Hut	[Direct, on-farm milk sales] Founder and farmer
8. Muller-Wiseman	[Largest milk supplier and distributor in the UK] Farm business manager
9. Dairy Crest Direct	[Independent representative body for farmrs selling milk to Dairy Crest] Director
10. Davis and Parsons LTD	[Wholesale of dairy products] Directors
11. OMSCo	[Organic Milk Suppliers Cooperative – supplies the majority of the UK's organic dairy processing and exporting needs] Farm technical manager [Organic Milk Suppliers Cooperative – supplies the majority of the UK's organic dairy processing and exporting needs] Head of membership



SUFISA WP2, Task 2.3

Semi-Structured Interview Guide

Record these details for each interview:

Interviewee organisation:

Interviewee name:

Interviewee position:

Interviewee contact details:
Address (inc. Post code)

Telephone number

Email

Date of interview:

Interviewer:

Recording the interview. Where possible, it is envisaged that the interview will be digitally recorded and written up. This will allow for a more complete record of the conversations and enable a better understanding of the subtleties of the conversations.

It is important to stress to interviewees that individual confidentiality will be assured through the anonymisation of their comments.

We want to record the interview, but there will be 'NO INDIVIDUAL ATTRIBUTION' within any of the reports produced.

The interviews are expected to last up to a maximum of one hour.

Introduction

The overall project will encompass 22 case studies in 11 partner countries. Milk will be studied in the UK, France, Denmark and Latvia; feta case study in Greece.

The purpose of SUFISA is to identify sustainable practices and policies in the agricultural, fish and food sectors that support the sustainability of primary producers in the context of multidimensional policy requirements, market uncertainties and globalisation.

Our focus here is on dairy farmers in Somerset. We want to understand how dairy farmers can develop resilient systems of production in the face of market and regulatory changes (e.g. price volatility, abolition of milk quota, Brexit) and to identify potentially sustainable **supply chain arrangements** that enable this.

We have conducted a desk-based review of the literature available on dairy, but would like to make sure we have an accurate and up-to-date grasp of the issues by asking those directly involved in the milk chain - such as yourselves. There are a number of different areas that I want to talk to you about.

Section 1 – Contextual information

- Can you please briefly say a few words to introduce the organisation (type of company, when it started, main activities, main products sold, etc.)?
- What is the organisation's role in the milk supply chain (producer co-op, processor/wholesaler, etc.)?
- What is your particular role within the organisation (e.g. manage milk contracts, milk supply chain manager)?
- We are particularly interested in markets and regulations as they relate to dairy farming in Somerset/SW England, including small-scale and family dairy farms.

Section 2 – Supply chain arrangements

- Can you briefly describe how many farmers you buy milk from and where and where the milk sold to? (i.e. describe SC)
- How you buy milk from dairy farmers?
- Has this arrangement changed over time and why?
- What pricing arrangements do you have and why? (spot market, contracts, A&B, etc.)

Section 3 – Markets and milk prices

Markets

- Overall, what would you say are the **key markets for milk**? (processors/wholesale, direct, producer co-op, value added chains) UK or non-UK?
- What are the most profitable activities/markets for dairy farmers in Somerset? Milk, cheese, by-products (slurry manure)
- Pros and cons of particular market approaches, esp. for small-scale/family farms?
- Are there **market access issues** for dairy farmers? (e.g. availability of contracts)
- How are dairy farmers responding to market access issues?
- Innovations re. marketing strategies? New contract arrangements, adding value, diversifying, developing new markets?
- What about **production contracts**? Types of contract? Main contract arrangements in Somerset?
- Are contracts a good or bad thing? Why? Can they mitigate against low prices/volatility?
- Supermarket schemes (e.g. Morrisons scheme to support dairy farmers)?
- What role for **producer organisations**? (e.g. Dairy Crest DPO; now divided into two elements (for Muller and Davidstow). Are they a good or a bad thing? Why?
- **Organic dairy production and the organic dairy SC**? Benefits of moving to organic? Price premium? Arrangements? Organic dairy also susceptible to low prices/price volatility?
- What about functional dairy products? E.g., milk with enhanced Omega-3, calcium, lactose free? Possible strategy? Raw milk?
- What about PDO/PGI? Value added (e.g., ice cream, cheese).
- GM-free dairy? (GM-free feed)
- Are consumer preferences / demands considered/perceived at the farm level?

- Consumer demands, preferences and emerging trends? (sustainable nutrition, traceability and transparency)

Milk prices

- What is your view of the current milk price situation? Do farmers get a fair price?
- Is the milk price narrative more complex than sometimes described in the media?
- Which dairy products/SCs are more exposed to price volatility?
- How and why is the global market for milk affecting the price for Somerset milk producers?
- How do communicate milk price issues with dairy farmers in your group/that you buy from?
- What are the direct/indirect effects of low milk prices on dairy farmers, esp. in Somerset and on small/family dairy farms? How do low prices impact the milk chain?
- Are you monitoring advanced prices/market changes? If so, what tools do you use?
- How do you/dairy farmers respond to milk price issues? (strategies)
- What about production factors? Which are the most costly? Also linked to volatility?
- What role do/should supermarkets/SC actors play? The Gov.?

Section 4: Standards and finance markets

Standards

- What are the key standards for dairy? (public and private)
- Please describe the role and importance of standards? Market access / price premium?
- How do standards impact dairy / the milk SC? The costs involved?
- Are some public standards burdensome? (labelling, animal welfare...)
- What labels / certification schemes might help dairy farmers to survive?
- Ethics; the role of consumers; labelling, such as organic, local, fair trade. How important are these different approaches, and what might their role be?
- A 'Made in Somerset' mark? GM-free. Antibiotics.

Finance markets

- What role do financial markets play in relation to dairy and the milk SC? (futures, impact on selling, prices, access to supply chains, level of risk involved, etc.). Milk products, in general, are traded worldwide, but what about milk produced in Somerset?
- How responsive are investments to shock? i.e: is increasing investments (purchase more land, machinery, innovation...) a suitable strategy against low prices, etc..? Untimely investments can make farms rigid in responding to changes.

Section 5 – Policy and regulation

- What would you identify as the key policies / regulations affecting dairy farming / the milk SC? (milk quota, Climate Change policy, environmental regulations)
- What is the impact of these policies / regulations on dairy farmers/the milk SC?
- How are dairy farmers responding / reacting to them? (E.g., intensification, diversification, pluriactivity, co-operation, exit). Small-scale dairy?

Abolition of milk quota

Milk quotas were abolished in March 2015 after more than 20 years.

- What, in your mind, was the rationale/logic behind this policy change?
- Supply chain impacts?
- How has the abolition of quota affected dairy farmers? (positive/negative impacts – e.g. production effect, price effect)
- Is the abolition of milk quota linked to the current low milk prices? If yes, why?
- Will the change to milk quota create business opportunities?

The Milk Package

The Milk Package was introduced in March 2012 to better support – through different policies and measures - the participation of dairy farmers in the milk SC.

- Are you aware of it? Aims/purposes?
- A key feature is the ability for farmers to collectively negotiate contracts? Is this happening? What negotiations are happening? Role of producer organisations increasing?
- Is it helping dairy farmers in the UK/Somerset? How and why?

Article 222 of the CAP Market Regulation (1308/2014)

After the aid package in April 2016 the EC introduced new rules providing farmers the opportunity to jointly plan milk production. Article 222 allows for special measures to be activated when there is severe imbalance in the market (MS can curtail production for a period of 6 months to 1yr (i.e., form of dairy quota).

- The UK has not used Article 222.
- Can Article 222 impact UK dairy farmers, even if not implemented here?
- Do you support Article 222? Why?

Section 6 – Dairy – Looking to the future

- What do you consider to be the key issues / challenges / risk factors facing dairy farming / the milk supply chain at the moment and why (both internally and externally)? [Financial, ecological, climatic, policy, regulatory, market]. Small scale/family dairy sector?
- What do you expect will happen in terms of these issues in the future? What is the ability / scope of dairy farming to respond to the pressures / risks they face?
- **What are the implications of Brexit?** Opportunities/threats for dairy farming / the milk supply chain? Why?
- How might dairy farmers be more innovative in response to the pressures they face?
- How sustainable / resilient is dairy farming in Somerset?
- What might help dairy farmers to respond better, in terms of policies, regulations or access to markets?

Section 5 – Final comments

- Is there anything else you wish to add, that you feel we haven't previously covered in the interview?

At the end of the interview:

- Consider whether it would be useful for interviewees to take part in the Workshop. If so, ask if they would be willing to take part.
- Similarly in relation to the Round Table.
- Do you have access to dairy farmers? Would you be able to help with the producer survey?
- Do you have any advice as to how I might contact dairy farmers?
- Are there any particular parts of Somerset that I should visit?

Private Storage Aid Scheme

Dairy producers receive aid to store production excess when markets are unfavourable (i.e., when prices are low. Butter, cheese and skimmed milk powder can be stored.

- Are UK dairy farmers benefiting from this exceptional EU support scheme?

LEADER

- What has been the impact and role of the LAGs in supporting dairy farmers in Somerset? What impact has the LAG had? Integrate dairy with the wider territory/ local economy?

Animal Welfare

- The Animal Welfare Act 2006
- Five freedoms of the Farm Animal Welfare Council (FAWC)
- What, if any impact, has this had on dairy farmers in Somerset? (e.g. the production process, management of yards, diets of livestock, vet management)

Animal Health, Biosecurity, Antibiotics

- What are the key regulations / issues to be aware of?
- Infectious disease control and legislation?
- BTB: key legislation/regulations? Cattle movements/trading restrictions?
- What, if any impact, has this had on dairy farmers in Somerset?
- Increasing debate about antibiotics used to treat animals? How is this playing out in relation to dairy? (milk antibiotic residues) Standards/regulations?

Water Framework Directive

The EU Water Framework Directive (Dir. 2000/60/EC) requires that measures for mitigating point and diffuse pollution are taken, to ensure that water bodies meet environmental quality standards

- Main source of pollution on dairy farms: nitrates from livestock manure
- Impact of this Directive on dairy farmers?

Nitrates Directive and Nitrate Pollution prevention

Nitrate Pollution Prevention Regulations 2015 (SI 668-2015) came into force in May 2015. 62% of England designated as Nitrate Vulnerable Zones in 2010 (due to nitrates)

- Impact of this regulation (to reduce nitrate leaching) on dairy farmers?

Hygiene and food safety

The UK Food Safety Act, 1990: traceability standards required for food safety

- Key hygiene and safety standards for dairy farmers? (milk operations, milk storage)
- Impact on dairy farmers?



SUFISA Workshop – dairy farming and dairy supply chains in Somerset/SW England

Tuesday 23rd May 2017 10.30 – 15.00

Venue:

Junction 24 Ltd [Polden Room]
Market Way,
North Petherton
Somerset TA6 6DF
<http://junction24ltd.co.uk/>

Agenda

10.30 – 11.00	Arrival, tea and coffee
11.00 – 11.10 (10 mins)	Brief round of introductions
11.10 – 11.15 (5 mins)	Aims of the meeting
11.15 – 11.30 (15 mins)	Brief introduction to the SUFISA project / Points of clarification
11.30 – 11.50 (30 mins)	Presentation of work to date / key findings
11.50 – 12.45 (45 mins)	Discussion of work to date / stakeholder feedback
12.45 – 13.30 (45 mins)	Buffet lunch
13.30 – 14.45 (75 mins)	Debating future scenarios, following Brexit
14.45 – 15.00 (15 mins)	Conclusions and next steps – Delphi and reporting



SUFISA: Sustainable finance for
sustainable agriculture and
fisheries
Grant agreement no: 635577



8.4.13 Appendix 13: Dairy workshop attendees

Organisation	Role
1. AHDB	[Levy body funded by farmers] Senior Analyst (Dairy)
2. Wyke Farms	[Largest independent producer of cheese in the UK] Director
3. Yeo Valley	[Major organic processor] Founder
4. Harper Adams University	[University and specialist provider of education for the agricultural and rural sector] Senior Lecturer in Food Policy and Management
5. Arla	[International cooperative and large producer of dairy products] Senior employee
6. NFU	[Member organisation/industry association for farmers] Chairman of the dairy board
7. Barclays	[Multinational bank, agribusiness division] Regional agricultural manager
8. Somerset Young Farmers Club	Vice-chairman
9. Crediton Dairy	[UK's leading dairy drinks businesses] Head of Milk Supply
10. NFU	[Member organisation/industry association for farmers] Chairman of the dairy board
11. CCRI, University of Gloucestershire	Dr Mauro Vigani – senior researcher
12. CCRI, University of Gloucestershire	Dr Damian Maye - reader
13. CCRI, University of Gloucestershire	Dr Hannah Chiswell – research assistant
14. CCRI, University of Gloucestershire	Ms Dilshaad Bundhoo – research assistant

8.4.14 Appendix 14: Dairy workshop pre-discussion table

What are your priorities in relation to Somerset's dairy industry over the next five years?	How will these be best achieved ?	What will be the key challenges/uncertainties in relation to Somerset's dairy industry, both during the negotiations and post-Brexit?
Building better and fairer supply chain relationships	Contract law Better farmer representation Farmers need to be demand led	Trade Agricultural policy
Better business environment on farm competitiveness Promote British dairy produce at home and abroad Security of trade across borders to protect supply chain management on farms Improved and accessible benchmarking	Better tax incentives Volatility management Data sharing Encouragement to use subsidies to incentivise	Labour regulation
Protecting against commodity price volatility Security and labour Build relationships Futures market needs more work Produce to a market – demand led Promotion of dairy More transparency	Insurance products Long-term forecasting Investment in robotics Communication Contracts Forecasts Simple to understand figures	Trade Non-tariff barriers Labour Tariffs/trade barriers Lack of choice where to supply
Closer relationships with producers Continue to grow as a business, but still be sustainable, profitable and environmentally friendly Continuity Improving the 'push-pull' dynamic Farmer to consumer Measurement Clearer identification and communication of lead and lag KPI – that are relevant to a given farming system	Becoming board members Keeping with best practice and become more focused on our cost of production Better transparency, information flow and communication Input in the sector to deliver fresh and new KPI and associated communication tools	Volatility due to rumours, media etc. Lack of clarity which reduces investment

The KPI need to be social,
economic and environmental
performance “triple bottom
line”

Stability

Aligning production to
requirements of market

Ability to plan long term

Better information

Future of farm support

Workforce of farmers and
processing industry

Access to international trade
Will farming cope with a no
trade deal?

Uncertainties over possible
trade tariffs that could be
implemented

Access to trade with EU

Sustainable/affordable levels of
tariffs for trade

Sustainable, realistic levels of
agricultural support for dairy
farmers within the UK once we
exit the EU

Competitiveness at global level

Improve ability of farmers to
manage: risks, price, cost disease
etc.

Trade relationships

Access to markets

Improve revenue stability so
farmers can invest and improve
efficiency

More business management
tools and skills

Reduce uncertainty

Understanding of how to
identify and manage risks in
their business