INTEGRATED WATER MANAGEMENT

NFU

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INTRODUCTION

As recent experience has shown, agriculture is particularly vulnerable to climate change and severe weather events. Incidents of flooding followed by periods of drought are becoming increasingly commonplace and, with experts predicting longer and more severe droughts interspersed with more frequent, intense rainfall events, it is vital we act now to safeguard our nation's food security, environment and livelihoods.

Climate change is the greatest environmental challenge we face. A joined-up approach to flood and drought risk management will, alongside work to achieve our net zero targets for greenhouse gas emissions, be critical in our approach to tackling this challenge.

Flooding can be devastating to a farm business. Flooded land is unproductive land, and it can remain unproductive for years afterwards. For example, if agricultural land is flooded by sea water, it can take up to nine years for the land to recover because of the damage caused to the soil by salt.

Equally, secure access to water during times of drought is essential for crop health and livestock welfare. Farmers use less than 2% of the total water abstracted in the UK, but most farmers rely on rivers and boreholes for water in the drier areas of the country at times of the year when water resources are under greatest pressure.

Agriculture and horticulture are the bedrock of the UK's largest manufacturing sector, food and drink, which contributes more than £100 billion to the national economy and provides thousands of jobs. Our ability to feed a growing population relies on access to a secure water supply. But increasing demands from the public water supply to meet the needs of housing growth, combined with the impacts of climate change, are already threatening this supply.

Around three-quarters of the water used to grow the fresh fruit and vegetables we eat in the UK has come from countries with greater water challenges than our own. If farmers and growers are going to rise to the challenge of growing more food like fruit and vegetables, they will need secure access to water supplies. And productive agricultural land must be properly valued following flooding events.

Farmers and growers can and do take practical steps to manage water on their own farms, such as improving the management of our precious soils, building on-farm reservoirs and installing rainwater harvesting equipment.

But the pressures faced by farmers and growers in managing 'too much' and 'not enough' water are likely to become so great that they will not always be solved at the farm level. Cooperation and collaboration within the farming community, and with other sectors such as water companies, will be vital in our response to managing extremes and in improving the quality of our water.

It is crucial that government demonstrates leadership in developing a framework for managing water. That framework should recognise water for food production and water for animal welfare as an 'essential water need', worthy of the same status as that enjoyed by the public water supply sector. Approaches to flood and drought risk management need to 'join up', to be more innovative and more ambitious. Key to the delivery of more integrated management of water will be the construction of better, more innovative infrastructure - built reservoirs and dams as well as natural flood management features.

Our agricultural and environmental direction post-Brexit presents a clear opportunity for British farming to become a global leader in sustainable, climate-friendly food production.

The NFU believes that an integrated water management strategy should be developed which gives farmers and growers a central role in the better management of land to improve water quality and the better management of water to tackle the dual challenges of floods and droughts – while enabling them to keep feeding the nation.

Stuart Roberts
NFU Deputy President

Farmers use less than 2% of the total water abstracted in the UK.

SOURCE: *Water usage on farms: results from the Farm Business Survey, England 2015/16, Defra/ONS, January 2017*

A SHARED VISION FOR AGRICULTURE

Water – whether we mean too much, not enough, or the quality of water – needs to be managed holistically. Agriculture has an important role to play in the sustainable use of water. Greater sustainability will rely on, among other things, improved **monitoring and measuring** of water (to ensure optimal use) and the identification of innovative techniques to reduce demand and reuse water, both at a farm and catchment scale.

Unlike other parts of the world, British farmers and growers can normally rely on 'green' water (rainfall) for growing crops such as grass and cereals. Growers of fruit and vegetables rely more on 'blue' water (abstracted from boreholes and river sources) as well as 'green' water. As rainfall becomes more erratic, crop production has increasingly relied on abstracted sources of water, but that too is now becoming less reliable. 'Grey' (reused) water is not of drinking water quality and is under-utilised in agriculture.

The NFU wants an integrated water management strategy to deliver optimal use of all three kinds of water across the agricultural sector. This could be achieved in a number of ways, including the **capture and storage** of abstracted water when it is in surplus following flooding and wet weather events. Water stored in this way can then be used in agricultural production during times of hot and dry weather.

There are also opportunities to capture and utilise rainwater through, for example, **rainwater harvesting** – tanks connected to the downpipes of farm buildings that collect rain falling on roofs. Collection of water in this way has the additional benefit of reducing localised surface water flooding and the management of soil and water runoff which helps improve water quality in our rivers.

Successful integrated water management relies on our ability to work together, both as groups of farmers and as a wider community of water managers with other sectors, users and stakeholders.

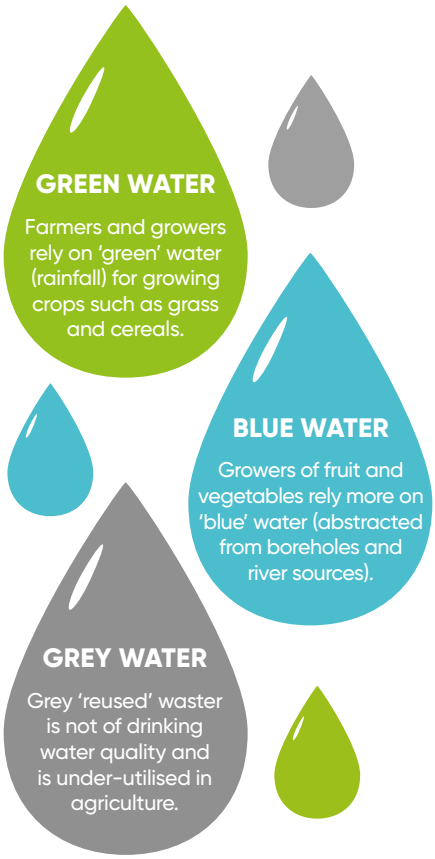
In farming this could be achieved through the formation of 'water management' or abstractor groups to coordinate and plan the way that water is managed in local catchments and, where appropriate, develop alternative water supplies – while driving down demand and reducing waste.

Water management groups provide the additional benefit of articulating local needs and how they can be met. They can provide other sectors and public bodies with an easy and effective way to work with groups of farmers and growers.

Agriculture and horticulture can become more resilient to extreme weather risk by working with other sectors. The development of **regional water planning** is an important step forward. It should create opportunities to promote multi-sector schemes where farmers, water companies, energy companies and others can share the benefits of new and improved facilities.

The creation of an integrated water management strategy would have four major benefits:

- Securing a fair share of water for agriculture and horticulture and establishing the agri-food sector as an essential user of water;
- Further developing the key role farmers and growers play in protecting and enhancing our environment.
- Driving technological innovation to improve flood management and water use, and supporting knowledge transfer to increase resilience to climate and water risks;
- Increasing national food security and supporting economic growth.



IMPROVING FARM RESILIENCE TO FUTURE FLOOD AND DROUGHT RISK

The series of floods and droughts across the country in recent years has once more highlighted the vulnerability of agriculture and horticulture to extreme weather and climate change. This vulnerability is exacerbated by the fact that farms and rural communities are often given a lower priority in the response to these events.

Understandably, funding for flooding currently prioritises urban areas and property. But this often leads to rural landowners experiencing a lack of maintenance of watercourses and coastal channels which results in more frequent, more extensive, and prolonged flooding events. This is an unsustainable and inequitable outcome, which causes damage to farming businesses and rural communities as well as impacting on the country's ability to produce food in the short to medium term.

But there is also an imbalance when it comes to water shortages. Farmers and growers, particularly those who produce high quality and high value fruit and vegetables, rely on access to water abstracted from rivers and groundwater. But access to water for crop irrigation can be constrained because water for the production of food is not considered to be 'essential'. There are obvious reasons why priority is given to domestic users when water is scarce, but this can result in irrigation being restricted on farms while at the same time cars are washed, lawns are watered and swimming pools are filled. We need a strategy that provides farmers with a fair share of water.

When planning to mitigate against the impacts of droughts and floods, the importance and contribution of our food and farming sectors to the health and wellbeing of the nation, the environment, and the economy, must not be overlooked.

In order to ensure that an integrated water strategy can be created and delivered, actions and measures to address flood and drought risk must be properly funded and the allocation of any funding must be transparent.

Recognising agriculture's role in managing flood and drought risk

Farming has a key role to play in flood management. Where farmers provide a service in mitigating flood risk to help protect others (for example, by providing land that can be flooded seasonally to reduce the severity or frequency of flooding in urban areas downstream) this must be a coherent, planned element of total catchment management. Farmers must be fairly compensated for delivering this service.

Farming also has a role to play in protecting and enhancing our water environment. We can improve our practices by using water efficiently and sustainably, and by adopting land management practices that, for example, retain moisture in our soils and minimise soil runoff into watercourses. This, in turn, helps to improve water quality.

Farmers manage 70% of England's land, providing substantial environmental benefits and ecosystem services. Although it is difficult to place a value on these services, landscape character, biodiversity, carbon sequestration and water quality are all delivered through careful management of agricultural land.

Helping farmers and growers to help themselves

Farmers and growers are already adapting their businesses to make them more resilient to extreme weather. Measures being adopted on farms include:

- Collecting surplus water from rivers for storage in reservoirs, and harvesting rainwater falling on the roofs of farm buildings and glasshouses. Stored water can be used later during times of peak water demand on the farm. It can also help to reduce local flooding.
- Using water-saving techniques, such as precision irrigation, to target application and minimise waste. Locating and repairing leaking pipes, and increased use of 'grey' (non-potable) water, also reduces waste.
- Adopting improved soil cultivation techniques to lock moisture into soils so that it is available to meet crop needs. Appropriate soil cultivation combined with the use of cover crops and buffering at field margins keeps more soil and water in the field and reduces the pollution impacts of soils entering water courses. This can also help reduce surface water flooding.
- Adopting on-farm flood and drought risk management and contingency planning by relying on improved forecasting of weather and water availability, together with improved measuring and monitoring of water use and its impact on agricultural productivity and the environment.
- Incorporating best practice in crop management, including grass and fodder for feeding livestock, such as the increased use of drought tolerant crop varieties.
- Increasing interest in a strategic approach to the effective delivery of straw from the arable to the livestock sector.

There is a pressing need to further equip farmers with tools to manage extreme weather events. Continued research programmes, with knowledge transfer and advisory packages, can help farmers to mitigate and adapt to climate change and extreme weather.

57% of farmers

say they have experienced extreme weather conditions in the past ten years

SOURCE: The flooding manifesto, NFU, January 2017

58%

of grade one agricultural land,

our most productive and versatile land, is situated in the floodplain

SOURCE: Developing the evidence base to describe the flood risk to agricultural land in England and Wales, R&D Technical Report FD2634/TR, Defra/ Environment Agency, November 2011

Innovative Water Management

The Global Water Partnership defines integrated water management as "a process which promotes the coordinated development and management of water, land and related resources in order to maximise economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems and the environment".

This means moving away from 'silo thinking', the better use of existing infrastructure to make it dual purpose where appropriate and the development of innovative new schemes.

We should identify national and international successes and be ready to recreate them. For example, progress made in the Netherlands has potential for duplication in the Fens and our other low-lying areas.

CASE STUDY

THE NETHERLANDS

Around 26 percent of the area of the Netherlands is at, or below, sea level. In the past, the country has been devastated by coastal and river flooding. With two-thirds of the densely populated country at risk of flooding, flood management is a national priority.

Flood defences take many forms, from natural sand dunes, man-made dykes, dams and floodgates to innovative dual-purpose underground multi-storey car parks which double-up as floodwater storage tanks during a storm surge. These all provide protection against fluvial or coastal flooding.

The countryside boasts a system of drainage ditches, canals and pumping stations (historically windmills) to keep the low-lying parts dry for urbanisation and agriculture, similar to that of low-lying parts of England like the Fens.

Central to the success of this system are water boards – independent local government bodies responsible for maintaining the system which are not only crucial for flood protection, but also ensure water is available when needed.

In the area it covers, a water board is responsible for:

- management and maintenance of water-related infrastructure – flood defences, dunes, dykes, quays and embankments;
- management and maintenance of watercourses;
- maintenance of water levels in 'polders' (drains) and watercourses;
- maintenance of surface water quality through wastewater treatment.

To control the quality of watercourses (canals, lakes, ponds and streams), water boards fulfil several tasks: policy making; planning and building projects; issuing permits (sewage discharge requires a permit); and the treatment of sewage and by-products. The various municipalities within the geographic area covered by a water board are responsible for collecting sewage from households and businesses, but the water boards transport and treat the sewage.

The Netherlands is understandably acknowledged as a world leader in its approach to integrated water management.

In particular, its approach to water governance through the successful development of multi-sector local catchment water boards to manage flooding, water use and water quality has much to commend it.

CASE STUDY

STUART ROBERTS

arable and livestock farmer

East Anglia

"My family has farmed in Hertfordshire for over 70 years. The farm is situated 130 metres above sea level and flooding has never been on our radar, nor have droughts. We retain water even in the driest seasons and it is rare to see standing water in any of our fields.

"I'd never thought we needed to manage water on the farm, until I realised the implications our water use and management could have on the local and wider communities and the environment.

"With increasingly intense rainfall events, especially summer thunderstorms, Hertfordshire has been on the news due to significant surface water flooding, whereas other parts of East Anglia have been suffering from agricultural droughts due to prolonged dry weather.

"Historically I admit, we didn't think this was our problem. That was until I started to look at the full catchment context in which my farm is situated. Being on the fringes of a town I knew I could do more to help mitigate the local surface water flood risk.

"So, while planning and designing a new replacement grain store and cattle yard, we decided to look into the potential for a rainwater harvesting system so we could collect and store the water from the roof. Traditionally, that water would have gone straight into the drainage network, which has not been updated since Victorian times and, at the best of times, is operating at capacity. In doing so, we did our bit to attenuate the surface water flood risk.

"The rainwater harvesting system has a specially designed filter which allows me to use it to provide drinking water for cattle, sheep and poultry and reduce – and eventually eliminate – our farm's reliance on the public sector water supply.

"In the grand scheme of things, this was a small step in improving our farm's water management. But if it is scaled up across many farms this could have a major impact on mitigating some of our water-related risks nationally."

The impact of infrastructure projects on farmland

The taking of land for major infrastructure projects - reservoirs, dams and pipes - to improve water management can have a significant impact on farm businesses. The development process must protect the needs of landowners and ensure that they are actively involved in the decision-making process. To ensure the best outcome for everyone involved we believe:

- **Compulsory purchase powers** to take land should be used as a last resort and voluntary agreements should be reached where possible;
- Developers should **promptly pay enhanced compensation** reflecting the dislocation, distress, income lost and loss of land as a result of a project;
- **Habitat mitigation** should be carried out to achieve 'no net loss' of biodiversity;
- **Land take should be kept to a minimum** and only the land needed for the scheme itself should be taken;
- Land should be **taken on a temporary basis** where possible and returned to agricultural use at the end of construction.

In addition, we believe:

- The developer should **communicate and consult** at an early stage with affected landowners and occupiers in regard to the proposed and final design of projects;
- Any **necessary accommodation works** should be incorporated within the design and implemented to minimise the impact on farm businesses;
- An **aftercare programme for soils and field drainage** should be planned, funded and implemented;
- An **'Agricultural Liaison Officer'** should be engaged at an early stage from pre-construction works;
- The developer/contractor should show **a duty of care** at all times to claimants.

HORTICULTURE AND POTATOES

The horticulture and potatoes sector is incredibly innovative and invests significant sums into water management to ensure water is used as efficiently as possible, with rainwater collection and harvesting, on-farm reservoirs, and trickle irrigation systems commonplace.

But the sector is vulnerable to drought, especially in areas where crops are not irrigated. For example, the North West region is typically one of the wettest in the UK and potato growers have traditionally relied solely on rainfall. Droughts can result in significant crop damage and loss where growers lack access to sources of abstracted water.

Favourable climate and soils in the South East and East of England regions, and areas such as the Vale of Evesham make them ideal for growing fruit and vegetables. Low or irregular levels of rainfall mean that irrigation is crucial, especially during drier periods.

Where crops are irrigated, constraints can be imposed on abstractions from boreholes and surface waters, restricting growers from accessing the water they need.

The regulation of abstraction must be improved so that it is more agile in permitting growers to utilise surplus water before it runs out to sea and by, for example, encouraging the sharing and trading of water among users.

Flooding risks vary across the country and impacts arising from periods of intense rainfall tend to be localised. Flooding can have a devastating impact on businesses and result in the total loss of high value crops. Low lying areas such as the Fens rely on a sophisticated network of drainage channels to limit flood risks, but these can be put under pressure when rainfall is unseasonably high.

Greater investment in infrastructure is needed to collect, store and distribute water, not only on individual farms but strategically within and between regions. Since horticultural production is primarily located in parts of the country with lower levels of rainfall, strategic investment is needed to ensure that water is transferred from areas of surplus to areas of deficit.

Regional water plans must take full account of horticultural demand when creating schemes for the bulk transfer of water from areas of surplus to areas of scarcity. Schemes should distribute water through pipes and existing open channel networks, supported by a network of multi-sector reservoirs.

CASE STUDY

ANTHONY SNELL

horticulture grower

West Midlands

"Our 200-hectare farm business grows organic and conventional soft fruits and berries. These fruits are highly perishable, so they are sold in both fresh and frozen form to minimise food waste.

"We've already achieved 'net zero' status for greenhouse gas emissions on the farm by improving productive efficiency – growing more food with reduced inputs – while locking up carbon in the grassland that covers the farm. Our fruit is grown on soil-free coir substrate and the 'tabletops' for fruit growing are installed on uncultivated grassland.

"We are also determined to drive down our demand for water and ensure that our use of this key resource is sustainable. We have achieved this by harnessing the heavy rainfall typical of the west of England through rainwater harvesting for use in crop irrigation during spells of drier weather.

"We have installed a series of water storage lakes on the farm which means that we now have the capacity to collect the rain that falls on our land and polytunnels. This water, which is collected in the lakes and then circulated through the polytunnels throughout the growing season, would otherwise run off our land and down the valley, contributing to flooding risks. It also means we don't place additional stress on water resources during the peak summer season.

"Trickle irrigation pipes, which run through all the polythene tunnels, 'drip' water onto the fruit crops and minimise water waste. Introducing these water efficiency techniques has helped us reduce the amount of water we use to produce the crop by 50 per cent.

"By regularly capturing excess water when it rains, we manage to keep our lakes topped up and so we have become very resilient to the risk of droughts.

"This simple but effective system of collecting surplus rain and storm water provides 80 per cent of our water needs and reduces the pressure for us to resort to abstracting water from our farm borehole or tapping into the mains water supply.

"As well as mitigating local flood risks, the farm lakes have conservation value and have quickly become a haven for wildlife. For the first time in my life on this farm, we now have otters here."

COMBINABLE CROPS

The impacts of floods and droughts on combinable crops such as cereals depends greatly on the season in which an event occurs. Given the seasonal nature of combinable crops, any unusually wet or dry spell is likely to have adverse consequences for the crop.

Summer flooding can damage crops and make harvesting conditions difficult whereas a spring flood can lead to delays in drilling new crops and damage to those already growing from an autumn sowing. Harvest can be extremely difficult during wet periods as soil condition must be restored after harvest.

In 2019/20, the very wet autumn and winter meant many farmers could not cultivate or drill crops, which contributed to a 38% reduction in the national wheat yield compared to the previous year. Arable farms do not have to be 'flooded' to suffer crop losses – the impact of wet conditions can also be significant.

Hot, dry conditions during the key growing season of spring can result in shorter straw length, less straw being available, and reduced yields due to plant stress. Prolonged periods of dry weather can lead to crop loss and also to the rejection of harvested loads by processors because they are not of suitable quality. If weather like this is then followed by wetter weather, it can cause fungal problems and secondary growth in cereals.

In general, arable crops need less water than horticultural crops, and the vast majority will not be irrigated unless they are grown on a farm where other crops are irrigated and there is spare capacity.

Where grain is stored after harvest, flooding can be a serious and expensive problem, although farmers will take steps to reduce any risk during the planning and construction of grain stores.

In order to attenuate the impacts of floods and droughts on the combinable crop sector water course maintenance is one of the main actions that can ensure farm productivity. This ranges between the maintenance of field drains, ordinary water courses or main rivers. Responsible water maintenance not only ensures that the land is drained enough to be drilled but also ensures sufficient moisture is retained in the soil to meet crop needs. The development and use of more drought-resilient crops and the adaptation of different cropping patterns can also help improve resilience and boost productivity.

SUGAR

Sugar beet finds it extremely challenging to grow in very dry conditions which can lead to late germination of the crop and variable yields. In an average year, ten per cent of the sugar yield is lost to drought, but this can increase to more than 25 per cent if conditions are exceptionally dry. While research has found that sugar beet roots can extend to 1.5 metres and deeper, most reports indicate that the majority of the water taken up by the crop comes from the top 60 centimetres of soil. It has been suggested that, deeper in the ground, sugar beet roots tend to pass through existing pores and are clumped together, meaning that they cannot access all the available soil moisture.

Irrigation is considered less important by many UK sugar beet growers, and many do not have spare water for beet. However, recently there has been increased interest in the possible irrigation of sugar beet crops.

If irrigation is an option, crops will respond well. Research has shown that irrigation in June and July will be more effective than later irrigation, with early irrigation helping with canopy growth, crop cover and light interception. Typically, plants with greater than 50 per cent crop cover will use between one and three millimetres per day.

The British Beet Research Organisation (BBRO) recommends that if growers are going to irrigate the actual soil moisture content should be measured, or a water balance sheet kept that can monitor specific crops. This is especially important in August when rainfall tends to be very localised.

CASE STUDY

LUCY AND MICHAEL SLY

sugar, mustard, pea and arable farmers

East Anglia

"Our family farming history can be traced back over 300 years in this area. Integrated water management is at the heart of our operations on our 2,000-hectare farm in the Cambridgeshire Fens and has played a crucial role in ensuring the farm's productivity since the Fens were initially drained in the 18th century," Lucy said.

"We have drains and ordinary water courses across the farm. These are crucial in ensuring the land is efficiently drained, allowing us to grow our crops in the fertile soil, while ensuring water levels are sufficiently maintained to ensure the availability of water for the surrounding area.

"We have also taken measures to increase the water quality of our drains by introducing 'scallops' which capture runoff. In doing so, they trap sediment and any surplus nutrients and prevent them going into the watercourse.

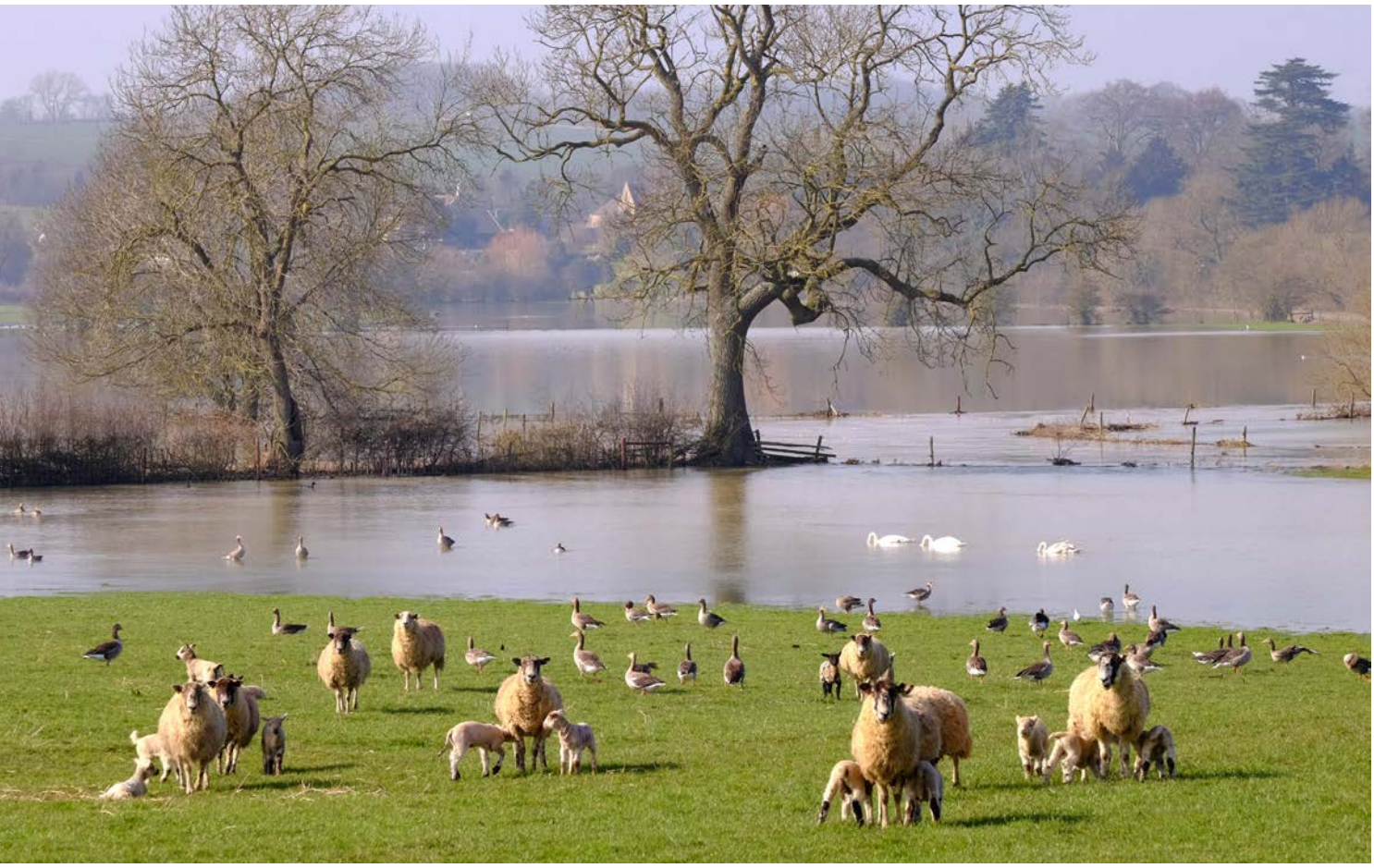
"The farm is also part of Defra's environmental stewardship schemes, allowing us to produce high quality food and create and maintain suitable habitats for birds and other fenland wildlife."

"I am chairman of the North Level District Internal Drainage Board, located in the heart of the Fens, which manages flood risk, water levels and water quality in the area", Michael said.

"The Internal Drainage District is mainly reliant on pumped drainage to remove surplus water from agricultural, industrial and urban properties, discharging it into the adjacent main rivers," he said.

"Drainage is essential to life in the Fens. Over recent years, when other parts of the country have suffered severe flooding to homes and industry, the Fens has remained unscathed in large part because of the prudent investment of our predecessors.

"We must not become complacent. We are at the mercy of the weather and must always be prepared for the next rainfall event or prolonged dry period."



LIVESTOCK

Flooding can have a significant impact on livestock farms, not least through loss of animals by drowning. Livestock must be moved to protect them from floodwater. Prolonged flooding reduces the available grazing areas for long periods of time, which puts additional pressure on the remaining grazing and forage stocks.

To help reduce flooding and speed up the dispersal of standing floodwater farmers regularly maintain field drains and ditches. Prolonged periods of flooding, especially in spring and summer, can kill grass that animals would graze on, which then has to be reseeded. Saturated areas often remain in flood prone fields which then need additional work to drain them.

Cleaning up after flooding often includes repairing fences, which have been damaged by debris or the force of the floodwater. It also involves the clearing up of pollution, such as plastic, as this can be ingested by grazing livestock, which can be fatal, or baled up when hay or silage making.

The livestock sector is generally more resilient than many other sectors to droughts. Livestock generally cope well in hot dry periods as long as they have access to shade, water and supplementary feeding. However, livestock farmers do rely heavily on rainwater for grass production to feed their stock. Prolonged dry periods can limit reseeding and the establishment of new grass leys, as well as a reduction in fodder crops, maize, hay, and silage crops

Livestock buildings are usually supplied by mains water, although many rely on wells and boreholes. Since farms are located in isolated rural locations they are particularly vulnerable to disruptions in mains water supplies, arising from low water pressure and leaking pipes, which can have animal welfare implications.

Farmers can become more resilient to supply interruptions by installing secondary water sources such as rainwater harvesting, and by carefully monitoring water use as a way of detecting leaks.

DAIRY

The dairy sector is a significant user of water. An adequate, constant, and reliable supply of fresh drinking water is paramount for all livestock. In dairy, water is needed to ensure maximum milk production and is vital for animal welfare .

Clean water is also needed in large quantities for cooling milk and washing down the parlour. Crops grown on farm for forage and feed also require water, which is provided by rainfall on the fields rather than irrigation.

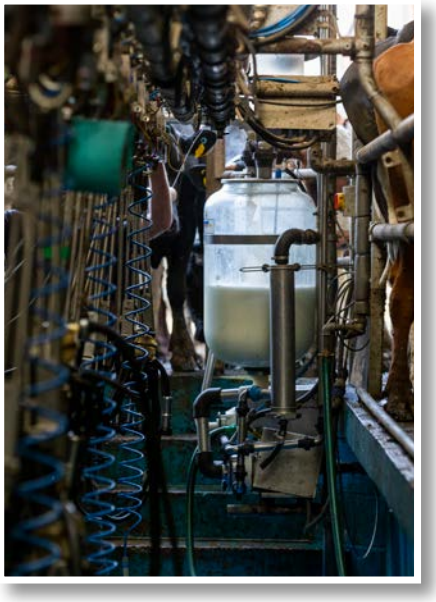
Drought has the potential to severely impact the dairy sector, even at a market level. This is because, in drought situations, there may be a shift to using supplementary feed when grass fails to grow, which then has an effect on milk production. In the 2018 drought, this had a knock-on effect on winter milk production levels and put pressure on the marketplace due to unexpected volumes. In 2020, dry conditions meant that the spring flush was, in fact, attenuated due to a lack of grass growth.

In the summer, grazing herds can be affected as drought conditions can affect the quality of the grass, which leads to protein levels in the grass dropping and a reduction in production.

Flooding can also be extremely challenging, especially for farmers running extended grazing seasons or growing arable or maize crops. Flooding and drought impacts on arable farms can reduce straw availability for bedding on dairy farms and therefore increased the costs of production.

There can also be very regionalised impacts. For example, in the summer of 2020 there were widespread droughts in the South and East of England, while the North and West had a very good grass growing season overall.

Flood resilience is also important. Flooded sheds or yards can cause welfare issues and flood damaged crops can have implications on the availability of feed. This, in turn, can affect business decisions, with farmers selling cows because of the cost of buying additional feed, not having enough feed to go around, or stored feed being spoiled in severe flooding situations.



POULTRY

The poultry sector can be impacted in many ways by both floods and droughts. A flood or drought has the potential to severely impact bird welfare as well as having an effect on overall productivity.

As well as these direct impacts, floods and droughts can also have a significant indirect impact on poultry producers through the effect they can have on the availability and/or quality of the crops required for poultry feed.

Poultry producers are mainly importers of water, using mains or bore hole supplies to provide the water that the birds need to drink. Some poultry producers have started to implement rainwater harvesting in order to capture and utilise natural sources of water and there is further work to do to investigate the merits of these systems.

Water is one of the most important inputs that a bird requires in order to thrive and a clean, fresh supply of water is essential to the health and welfare, as well as the productivity, of any flock. Producers in areas affected by drought conditions can face problems in getting the water they need for their flocks.

Flooding can present significant challenges to the poultry sector. Flood water which gets into poultry houses can carry disease, while flooding on range areas can attract wild waterfowl that may also be carrying disease. Severe flooding can pose a threat to bird welfare and in the past flash flooding has caused severe problems in some areas of the country, ultimately, in extreme cases, resulting in the loss of birds.

Water management is extremely important to the poultry sector so that the welfare of birds can be prioritised, and productivity maintained. Responsible use of water is also important and poultry producers are continuing to look for innovative ways to capture and utilise water within their business operations.

CASE STUDY

SIMON BARTON

poultry farmer

South West

"I manage a poultry business in the South West which has 190,000 birds over two sites. In 2016, I expanded the business by creating two new sheds which had a floor area of 38,000 square feet, and to gain planning permission I had to take into consideration the impacts on the wider environment of the conversion of the area from a greenfield area to the new poultry sheds.

"As with any project of this kind, an Environmental Impact Assessment was carried out. This covers all potential environmental consequences of a project before any decision is made to move forward with it.

"The assessment showed that I would have to take considerable measures to mitigate any potential impact from rainfall onto the site due to the size of the sheds. As the land use would be altered, measures had to be taken to ensure the rainfall that would have naturally fallen and drained through the soil into the groundwater system would not fall onto the new surface, immediately turn into runoff, and increase the local flood risk.

"In order to overcome this, I created an attenuation pond which has been designed and engineered to take the rainwater that falls on the roofs of the sheds. The pond and the whole mitigation system have been designed to handle a one-in-100-year rainfall event.

"The pond not only helps to reduce the local flood risk. It also helps improve the water quality because any sediment is trapped in the pond and left to settle rather than ending up in local rivers. It also helps ensure groundwater levels remain stable in the summer months which helps to maintain moisture levels in the soils for crop growing. It provides a great service in managing our water."

POLICY ASKS/ ACTION PLAN

The government's strategy for integrated water management should be to Plan, Protect and Invest. It will also need an action plan that is realistic and has a time frame attached to it.

PLAN

- Develop long term multi-sector collaborative plans for managing water scarcity where food production is recognised as a priority user.
- Develop and promote best practice in the management of soil and other resources to improve farm resilience.
- Create local, catchment-based decision making which will be better informed and ensure collaboration between all stakeholders.
- Design policy measures to support farmers in managing the impacts of weather and market-related volatility, including floods, droughts and water scarcity.
- Improve the UK's weather forecasting capability.
- Plan, agree and pay for natural flood management or flood water storage on agricultural land, as part of a total catchment management programme.
- Be innovative in its approach to the water collection, storage and distribution network (including pipes, rivers and canals).

PROTECT

- Deliver maximum and timely flexibility in the application of water abstraction rules.
- Remove blockages in the abstraction licensing and planning regulations that impede the construction of more on-farm water storage reservoirs.
- Overhaul methods for communicating with those affected by flooding which must reach the most remote communities, providing sufficient time for response.
- Carry out proper assessments of the value of agricultural land in decisions to invest in flood defences and holistic (innovative) water infrastructure.
- Where the Environment Agency seeks to withdraw from carrying out river maintenance, ensure it is adequately resourced to analyse the implications, and consult appropriately and properly with local groups.

INVEST

- Allocate the funding needed to build infrastructure for flood protection and the storage and distribution of water resources.
- Introduce tax incentives to encourage investment in farm reservoirs and new environmental land management schemes to encourage water efficiency measures delivering more crop per drop.
- Invest in improved monitoring and measuring of abstraction to make best use of available water.
- Replace aging infrastructure to provide a system that is fit for modern demands.
- Champion research and development to develop innovative solutions to water management challenges.

OUR COMMITMENT

Farmers have much to offer in the development of an integrated water management strategy. On behalf of our members and working with others, the NFU pledges to:

- Promote the implementation of contingency planning on farms to tackle the dual risks of flooding and water supply disruption.
- Better understand our water demand and act to reduce waste.
- Encourage best practice in the management of land and water.

INTEGRATED WATER MANAGEMENT

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