

improving environmental performance



Environmental Plan for Dairy Farming



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Why develop the *Environmental Plan for Dairy Farming*?

Focussing on the environmental challenges of their industry is not easy for most dairy farmers. They are struggling to break even in a tough economic climate. However, the industry recognises that these challenges are not going to go away. If we achieve the goals in this plan we may improve, or potentially even solve, some of the sector's environmental problems. It will make it easier for farmers to comply with environmental regulation and prepare the industry for some of the future challenges that might lie ahead, especially in the Water Framework Directive.

These goals are positive on their own. However, it is also important for dairy farmers and their representatives to get encouragement and see benefits from their efforts to improve their environmental performance. If the sector can show that it can take ownership of environmental problems, it can reduce the need for regulation and have a convincing case for support in addressing future challenges and cost pressures.

There is also an important economic dimension for the dairy supply chain and the industry's major customers. They must work to ensure that the consumer is made aware of the investment made by British dairy farmers to improve the environment, and that they are encouraged to reward them for their efforts.

Introduction

The Environmental Plan for Dairy Farming sets out a framework to improve environmental performance on dairy farms. Dairy farmers will face many environmental challenges in the next few years. The plan explains what these challenges mean for the industry and identifies ways that industry and government can work together to address them.

The plan does not impose new regulations or other burdens on the dairy sector. Instead, it encourages dairy farmers to voluntarily take ownership of environmental issues and solutions, to improve environmental performance, and therefore reduce the need for further regulation. As well as the major environmental challenges, there are also major economic difficulties for the sector which this plan can't ignore.

The plan aims to:

- ◆ highlight the aspects of dairy farming that have the most environmental impact;
- ◆ highlight practices or initiatives that could help to tackle the problems; and
- ◆ identify how the sector can work with regulators to achieve the greatest environmental benefit.

It is important to note that this document merely sets the framework for the Environmental Plan for Dairy Farming initiative. Implementing the plan will be the key to its success. This will rely on us working with the whole dairy industry and delivery providers to achieve the key objectives of this plan. There is more detail on the delivery in the 'putting the plan into practice' section of this report.

Key stakeholders

The plan was initiated by the Environment Agency, NFU and the Milk Development Council. We were concerned about the environmental challenges that lay ahead for dairy farmers and wanted to help farmers meet those challenges and lessen their environmental impact at least cost. It soon became clear that putting our ideas into practice would require the help and support of a wider group of stakeholders. So, we set up a steering group of the key stakeholders that have developed the plan: the Environment Agency, NFU, MDC, Dairy UK and RABDF. The group will co-ordinate the evolution and delivery of the plan. Defra has commented on the plan and Welsh Assembly Government has been invited to do so.

It is important that industry and Government work together to develop the plan. For Government, being involved in the plan will help achieve regulatory compliance and reduce environmental impacts from dairy farming. For the industry, working with Government will allow it to show that voluntary measures can be more effective than regulation.

We have consulted other organisations and individuals on this plan because we recognise that they have an important role to play in helping us achieve our goals. These groups include environmental bodies such as FWAG and LEAF, the agricultural supply industries represented by AIC, private consultants, farming organisations, the RSPB and others.

The environmental challenges

The dairy sector includes around 14,000 producers in England and Wales, who manage 150,000 square kilometres of land and milk 1.7 million cows¹. Milk production accounts for 18% of the United Kingdom's total agricultural output. Dairy farming, together with other industries that depend on it, is an important economic and social feature in many parts of the countryside.

Much of the countryside is land managed by farmers and growers. Agriculture's important role in the wider rural environment is becoming increasingly recognised.

Many dairy farmers are already making a positive contribution to the environment. They're adopting management practices that are environmentally beneficial, such as crop rotation - they're also carefully managing pasture land and fencing of watercourses. The landscapes created by dairy farming in many parts of the country have a high amenity value. Also, changes in support payments to farmers now mean that they'll be assessed on the environmental condition of their land to qualify for their Single Payment.

Nevertheless, we know that dairy farms can pose environmental risks for the following reasons:

- ◆ Dairy cows produce large quantities of slurry and manure. Both can be highly polluting if mismanaged;
- ◆ The effluent from grass silage is highly corrosive, so it's difficult to manage safely and highly polluting if it enters water courses;
- ◆ Autumn harvesting of forage maize can lead to soil compaction if the soils are wet, and this can cause excess run-off and soil erosion;
- ◆ Dairy and parlour washings and rainfall on extended yard areas greatly increase the total volumes of effluents that require careful management;
- ◆ The daily movement of dairy cows from field to parlour, and outdoor grazing in inappropriate field conditions, can lead to soil compaction, poaching and run off.

There has been a trend towards increasing the scale of milk production on farms in order to increase their efficiency and commercial viability. Production has therefore tended to intensify on most farms and the number of dairy cows per farm has increased.

¹ MDC datum, <http://www.mdcdatum.org.uk/farmdata/farmdata.htm>

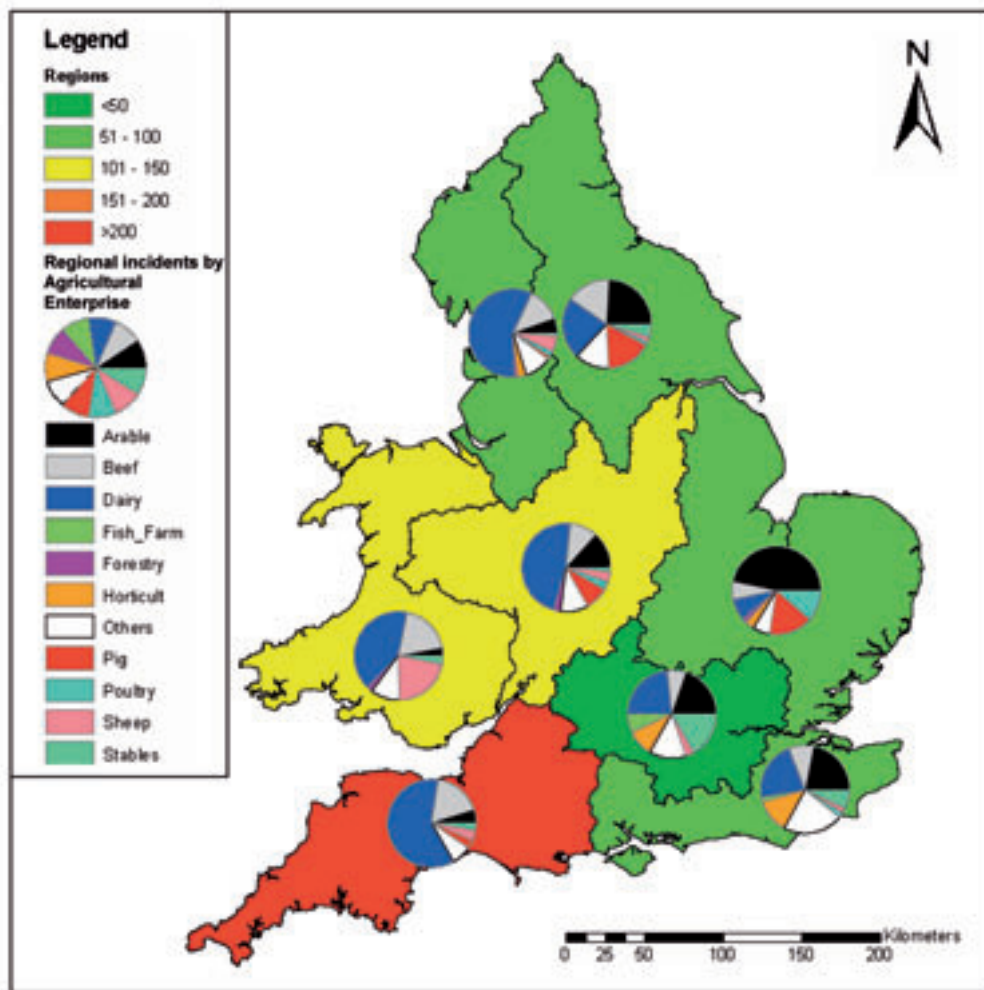


Figure 1. Agricultural enterprise as sources of pollution incidents category 1-3, as well as total numbers of incidents, by region (2004). (Environment Agency data)

Since 1996 the number of pollution incidents recorded in England and Wales has reduced. This is in part due to the effort and investment by the Environment Agency and the sectors it regulates.

Environment Agency data shows dairy farms have accounted for a large number of agricultural pollution incidents in England and Wales. Figure 1 shows the 2004 data.

Dairy farms were responsible for just under half of the agricultural incidents in 2004 where the source was classed as from land/fields. Dairy farms were also responsible for a third of all agricultural incidents related to above ground storage tanks.

Regulatory challenges

Dairy farmers face increasing environmental restrictions and regulations. These cover the following topics:

- ◆ Control of Pollution (Silage, Slurry and Agricultural Fuel Oil);
- ◆ Nitrate Vulnerable Zones and Action Programme of Measures;
- ◆ Waste Management Licensing, Duty of Care and other waste matters;
- ◆ Water Resources including Discharge Consents, Anti-Pollution Works Notices;
- ◆ Sludge (Use in Agriculture);
- ◆ Groundwater Authorisations;
- ◆ Water Abstraction Licences;
- ◆ Protection of Habitats and Wildlife.

The new Single Payment Scheme (SPS) includes a cross compliance regime. This regime links the farmer's payment to some environmental legislation and requires farmers to maintain their land in 'good environmental and agricultural condition'. This is a strong incentive for them to maintain high standards of environmental protection on their farms.

Some dairy farms have had difficulties in complying with Nitrate Vulnerable Zone (NVZ) rules. From December 2001 until the end of 2004, 26% of dairy farms visited by the Environment Agency were not complying with the full requirements of the action plan. The most common reason for this among dairy farmers was the lack of adequate records for slurry / manure and fertiliser applications.

Proposed changes to the NVZ Action Programme Measures are expected to impose stronger controls on dairy farms located in NVZs. These changes are likely to extend the closed periods on spreading of slurry and other high nitrate manures, increase the level of mandatory storage capacity required and place new management restrictions on using slurry. The impact of these changes is compounded by including NVZ requirements into cross-compliance.

Dairy farmers will probably have to make important changes to their management practices to comply with the Water Framework Directive. The Directive requires that water bodies meet good quality standards. This will focus attention on diffuse pollution sources as well as pollution incidents.

Any future legislation may also have a major impact. The Bathing Waters Directive, Shellfish Waters Directive and the Integrated Pollution Prevention and Control programme could mean new obligations for the dairy sector. The impact of future legislation could be reduced if we see progress through early voluntary action by the dairy sector². An excellent example of this is the very good compliance with the Bathing Waters Directive in Wales, which has followed collaborative, voluntary actions.

Structural challenges

Farm expansion has created a need for big infrastructure changes to accommodate more cows and make more efficient use of labour. However, many people think that over the past 20-25 years the capacity of the sector to manage slurry, manure and other sources of pollution has not kept pace with their increased milk production. This view is reinforced by the fact that a quarter of the dairy farms that didn't comply with the NVZ action plan measures had inadequate storage for slurry. By taking steps to reduce their environmental impact, farmers will face large investment costs for things like buildings and slurry storage facilities. To be able to afford this, the farms need to be profitable.

Economic and social considerations

The economic situation of dairy farming is critical to the industry addressing these structural challenges. The viability of dairy farming largely depends on the price paid for milk. There are several things that influence the price paid to individual farmers, but according to Defra the average price paid to farmers was just over 18 pence per litre in 2005 and has fallen sharply in 2006. Estimates produced for Defra by the University of Manchester in 2003³ indicated that fewer than 40% of dairy farmers were making a profit let alone able to reinvest adequately.

Milk prices have not kept pace with inflation while costs of production have. This has put farmers under intense financial pressure. As well as making dairy farming economically marginal, this market structure has major consequences for the environment. The current nature of the raw milk market and the structure of the supply chain make it very hard for extra costs on the farm to be passed onto consumers. This limits the farmer's ability to invest in anything that doesn't directly increase production or lower production costs. Many investments that help

² Full text of environmental legislation is available from Her Majesty's Stationery Office at http://hmso.gov.uk/legislation/about_legislation.htm. Guidance is also available via the Environment Agency's NetRegs website at <http://www.environment-agency.gov.uk/netregs/sectors/1029415/1029774/1032420/>.

³ The economics of Milk Production England and Wales 2002/3; Colman Farrar, Zhuang, 2003

address environmental problems are difficult to justify economically, even for the best intentioned farmers. The situation is often more difficult in the tenanted sector where the poor economic climate discourages some landlords from making the necessary long-term investments on behalf of their dairy farming tenants. Regulations that impose new costs can also greatly influence the rate dairy farmers leave the industry.

Dairy farmers have working conditions that would be considered unacceptable in most other professions. A 2003 survey of more than 1500 dairy farmers concluded that the average dairy farmer worked 70 hours per week and took only four days holiday per year⁴. In addition to the stress this places on farming families, this makes it more difficult for dairy farmers to attend training courses.

Milk production has an economic multiplier effect and plays a major role in the rural economies of large areas of the country. Dairy farming is a highly specialised industry that supports a number of other enterprises, ranging from animal feed suppliers to large animal veterinarians. Together, these enterprises define the social character of many rural communities.

⁴ "Focus on Farming Survey"; Lloyds TSB, 2003.

Objectives of the *Environmental Plan for Dairy Farming*

The main objectives of the plan in the short term are:

- Objective 1: To reduce polluting discharges from dairy farms to water.
- Objective 2: To protect and enhance soil quality.
- Objective 3: To link environmental best practice with improved economic performance.
- Objective 4: To work to risk-based regulatory and environmental management systems.
- Objective 5: To improve transparency, understanding and engagement between the Environment Agency, dairy farmers and other stakeholders.

Objective 1: To reduce polluting discharges from dairy farms to water

Diffuse pollution from agriculture is a serious water quality issue. We know dairy farming can pose some high risks. If inorganic fertilisers or slurry are applied to land at the wrong time or in excessive quantities, nitrates, phosphates and pathogens can then leach through the soil into the groundwater or run off into surface waters. The costs of treating drinking water to remove contaminants considered a risk to human health (especially nitrates) are substantial. Milk, silage effluent and slurry are three of the most harmful substances (when added to watercourses) causing agricultural pollution.

Storing and handling manure and slurry the right way can reduce the risk of water pollution. Some pasture and cropland management practices can buffer surface waters against contamination from diffuse pollution. Careful regulation of the diet of dairy cows can reduce the levels of nitrates and phosphates in their excreta, whilst ensuring animal health and productivity. Completing Defra's Whole Farm Approach Nutrient Management module will allow farmers in England to benchmark their environmental management of slurries and manures. They can do this ahead of completing a full Nutrient Management Plan⁵. Farmers in Wales benefit from a similar service offered by Farming Connect⁶. Bacterial, and other inputs to water, can be minimised by managing the field, roadway and yard rainfall run-off, and restricting access to watercourses for watering.

The best way to measure success in achieving this objective is to monitor pollution incidents from dairy farms.

Objective 2: To protect and enhance soil quality

Sustainable farming is impossible unless soil health and productivity are maintained over the long term. Erosion can cause water quality problems and compaction can increase flooding problems. Farm machinery operations, land spreading practices, and pasture and cropland management are all important factors in prevention. For example, dairy farmers can manage crops in ways that minimise erosion, restrict cropping even further on fields that are highly vulnerable to erosion, or introduce comprehensive soil management plans. To receive a full SPS payment, farmers must do soil risk assessments and manage their land to minimise compaction and erosion.

⁵ <http://www.defra.gov.uk/farm/wholefarm/index.htm>

⁶ <http://new.wales.gov.uk/topics/environmentcountryside/farmingconnect/?lang=en>

Good soil quality will also affect the emissions of ammonia and carbon to air which will help achieve objective ii.

The best way to measure success in achieving this objective is to monitor the take up of soil management plans on dairy farms.

Objective 3: To link environmental best practice with improved economic performance

This is probably the most important objective of the whole plan. This is because successfully encouraging producers to take action for the environment hinges on them seeing some positive reward for their efforts. We believe that it is essential to promote measures that are both beneficial to the environment and cost effective for dairy farmers. We want to demonstrate these 'win-win' approaches where we can and find the best ways to promote them.

We believe that better resource management on farms can be economically beneficial for farmers and better for the environment. Measures that reduce the use of goods such as inorganic fertiliser or fuel oil, can reduce costs while at the same time reducing environmental impact. Also, a number of the measures are designed to ensure the health and productivity of soils or livestock, which is essential for the long-term economic viability of the dairy farm⁷. Some positive measures may require a large up-front capital cost (eg separation or slurry storage facilities) but could save large sums of money in the longer term.

The best way to measure success in achieving this objective is to monitor the use of nutrient management plans on dairy farms.

Objective 4: To work to risk-based regulatory and environmental management systems

We believe in a risk-based approach to environmental improvement. Regulation is a last resort if we can show that voluntary measures are effective. Where regulation is introduced it must be targeted.

We believe that voluntary approaches, where farmers take ownership of environmental problems and the solutions, can be a powerful way to help the dairy sector reduce pollution incidents and improve compliance with regulations. They can also help farmers meet their customers' and neighbours' expectations and help them remain or become profitable.

A good example of this will be Catchment Sensitive Farming, which in England is a joint initiative between Defra, Natural England and The Environment Agency to tackle diffuse water pollution from agriculture. By using land management practices to reduce agricultural sources of diffuse pollution within river catchments, we can ensure that emissions to water are consistent with ecological requirements. We have identified priority catchments as areas for action, which we'll target with a range of measures to improve farm practices and reduce water pollution from agriculture. Advisers will work individually with farmers, as well as leading a series of initiatives including workshops and farm demonstrations to encourage best practice. We are working with the Catchment Sensitive Farming partners to ensure their advisers are aware of the challenges posed and faced by dairy farmers, so they can offer support while recognising that the focus is on catchments rather than sectors. Welsh Assembly Government has recently commenced Catchment Sensitive Farming pilots in two areas.

The best way to measure success in achieving this objective is a reduction in environmental breaches of cross compliance on dairy farms.

⁷ Bragg S, Inman A, Manning C, Pitcairn J & Wood C (2005) Assessment of 'Win Win' Case Studies of Resource Management in Agriculture. A report for the Environment Agency & English Nature. March 2005.

Objective 5: To improve transparency, understanding and engagement between the Environment Agency, dairy farmers and other stakeholders

It is important that we all know how we can achieve our environmental objectives for the dairy sector and what the barriers are. Steering group members are working together to help the dairy industry address environmental challenges on dairy farms, but there is scope for more collective working across organisations.

A big part of ensuring our activities are co-ordinated has been creating the steering group that developed the plan. We recognise the need for ongoing engagement so we can maintain the momentum behind the plan and make improvements in environmental management on dairy farms.

It is also critical that our high-level discussions and intentions translate into actions on the farm. There are no easy solutions to this, as there are many organisations who advise, guide and support dairy farmers.

We will be succeeding in this objective when we see an increase in positive attitudes from farmers in surveys such as the Environment Agency customer survey.

As well as these first five priorities, there are several other objectives, which we believe must be tackled as the plan evolves.

Additional objectives

Although implementing this plan focuses on water and soil related problems we recognise that the challenges go much further than this. There are a number of other objectives we want to tackle:

i. Waste

Dairy farms produce large quantities of solid non-natural waste, like silage wrap and other plastics, agro-chemicals containers, tyres, batteries, and oil. New regulations mean that most of the previous disposal practices such as open burning and burial in farm tips is now illegal. However, farmers can take advantage of several exemptions from the Waste Management Licensing regime in order to store, recover or use certain types of waste⁸. For example the landspreading of treated sewage sludge under the Sludge (Use in Agriculture) Regulations on dairy and arable farms recovers nutrients and humus for agricultural benefit. About 65% of the UK's treated sewage sludge is managed in this way.

Some of the activities this plan encourages can reduce the need for goods like inorganic fertilisers. This will in turn reduce the amount of packaging waste that farmers need to manage and potentially reduce their costs. There may also be new business opportunities for generating additional income, for example running collection schemes for waste farm plastic.

ii. Emissions

Manure and slurry can generate odour complaints. They can also release ammonia, methane, volatile organic compounds, hydrogen sulphide and other pollutants to the air. Nitrates in heavy soils can be lost to the atmosphere as nitrogen gas or nitrogen oxides if the soils become waterlogged in warm conditions.

Agriculture was responsible for more than 7% of the UK's greenhouse gas emissions in 2002⁹. Dairy farms were a significant contributor, mainly due to methane emissions from animals and slurry stores. Methane has 32 times the warming potential of carbon dioxide, which is the most plentiful greenhouse gas. There is public pressure building to tackle emissions from agriculture. A wide range of management options exist for minimising on-farm energy consumption, which can reduce greenhouse gas emissions. These options include the type and use of manure storage, the handling and spreading of slurry and using tools such as the MDC's energy efficiency fact sheet.

⁸ For further details on the Agricultural Waste Regulations and registration of agricultural exemptions contact the dedicated Agriculture Waste helpline 0854 6033113 or see <http://www.Environment-Agency.gov.uk>

⁹ "Environmental Accounts"; a National Statistics publication, Autumn 2004. Available at http://www.statistics.gov.uk/downloads/theme_environment/EANov04.pdf

Dairy farms could also be excellent sites for renewable energy projects. The opportunities for anaerobic digesters and biomass production are increasingly promising, and dairy farms could contribute to the UK meeting its climate change challenges, commitments and goals.

iii. Habitats and biodiversity

Dairy farms can be valuable habitats for wildlife. Many species of mammals, butterflies, birds, and plants are found on farmland. Unfortunately, many farming practices that were adopted before biodiversity issues were widely appreciated have contributed to a rapid decline in the number and range of species. A better scientific understanding of the links between this decline and farming practices is leading to changes in land use policies.

Declines in birds that are farmland specialists, for example lapwings and corn buntings, have been bigger than in other species. This is probably due to three factors: the loss of nesting sites and the lack of seed food in winter and insect food in spring that often results from agricultural improvements. While a range of agri-environment and voluntary measures can protect and enhance farmland wildlife, historically uptake has come more from arable and upland sectors with fewer options attracting dairy farmers.

Resource protection and biodiversity are naturally compatible. For example, by encouraging actions that will improve water quality, this plan will also benefit aquatic invertebrates, fish, fish-eating birds, and other aquatic species. A key feature of this plan is promoting and developing agri-environment schemes. These schemes include actions to protect and enhance farmland birds and other wildlife, as well as new measures to help protect natural resources.

iv. Water use

Dairy farms can use a lot of water. Clean water is a resource that often comes at a big cost to the farming business. Clean water must be supplied to dairy cows and is often used for cooling milk and washing down parlours, machinery and yards. A lot can be done to ensure wastage of clean water is kept to a minimum and the use of roof and other green water is maximised.

Many dairy farms are in areas of the country that have high rainfall. This contributes to many of the pollution issues highlighted earlier in this report. Collecting rainwater can help stop it adding to the problem of dirty water and slurry storage and also enable it to be used on farm.

Putting the plan into practice

We can achieve better environmental performance in a variety of ways, including:

- ◆ voluntary measures;
- ◆ education;
- ◆ best practice advice;
- ◆ farm assurance schemes;
- ◆ research and development into best practice;
- ◆ management tools;
- ◆ incentive schemes;
- ◆ long-term profitability of milk production.

We want to improve environmental performance by focussing on some specific measures, which are both effective and economical. They're also easy for dairy farmers to adopt.

The tasks outlined below will not solve all of the dairy sector's environmental problems on their own. Rather, they form the basis for the key stakeholders to move forward together in addressing the highest priority challenges. The plan should be seen as a dynamic process where industry stakeholders can adapt regularly to improve delivery and provide the right tools and messages to farmers and their supporters. The plan should also evolve to tackle other environmental concerns.

In implementing this plan, we will consider the difference in governance of England and Wales, as well as local issues.

A. Developing a ‘toolkit’ to support best practice on dairy farms

We do not think there are single solutions for all farming situations, but we do think that there are simple tools that farmers can and should use to lessen their environmental impacts. Nutrient management plans are a good example. It is essential that farmers and their advisers have a range of ‘off the shelf’ tools available to them, so we’re keen to develop a simple ‘toolkit’. This could include:

- ◆ NMP tools (many of which are already available)
- ◆ factsheets
- ◆ win-win case studies
- ◆ energy audits.

We will work to find ways to make infrastructure investment affordable to dairy farmers and we ensure they have reasonable access to any technical help necessary.

B. Nutrient Management Planning

We believe that Nutrient Management Plans are extremely useful tools that can help farmers manage the environmental impact of the materials they use on their farms. The plans can also help them control their costs. Therefore, every dairy farmer should be encouraged to develop and implement a nutrient management plan (NMP). These plans can be a stand-alone tool for farm management or NVZ compliance, or used as part of an agri-environment scheme application or environmental management system. They can also be developed through participation in programmes like the MDCs grass+¹⁰ programme or LEAF¹¹ audits. Tools like the computer programme PLANET (Planning Land Application of Nutrients for Efficiency and the Environment) are also available to dairy farmers and their advisers to simplify the process.

A good NMP is one of the best tools the dairy farmer has to reduce or eliminate the negative effects of dairy farming on water quality and aquatic biodiversity. NMPs can also benefit soil quality and may help farmers save money on inorganic fertilisers.

However, the concept suffers from a terminology complex and it is important that farmers see NMP tools as simple and effective. A number of organisations are working with farmers and consultants to deliver NMP tools. These include ADAS (Planet), LEAF, Farming Connect (in Wales) and AIC. We will work with all these organisations to ensure that NMP tools are effective and well supported by farmers as we believe they are a critical part of managing environmental risks.

C. Promote agri-environment entry level schemes

Dairy farmers should be encouraged to enrol in entry level schemes¹². This might not be suitable in all cases, but the schemes have been designed as ‘broad and shallow’ programmes that could apply to many farming situations.

The schemes offer a number of management options, which aim to protect natural resources without sacrificing farm productivity. Taking part in entry-level schemes, especially if farmers adopt the appropriate options, should lead to better water and soil quality and better habitats.

We are already taking steps to encourage dairy farmers to apply for an entry level agreement. We are also seeking to work with organisations that are directly involved in helping producers submit scheme applications.

It is appropriate to review the level of take-up of agri-environment schemes among dairy farmers. This may lead to a review of the communication to dairy farmers and also look specifically at the structure of the schemes. This

¹⁰ The Milk Development Council launched the grass+ and pd+ programmes in 2003 to deliver grassland and fertility management back to farmers. Further details can be viewed at, <http://www.mdc.org.uk/documents/MDCplan2005-07.pdf>. Second edition grass+ programme produced, with revised details on Optimising Fertiliser Practice.

¹¹ Linking Environment and Farming www.leaf.org.uk

¹² In England we include the related scheme, Organic Entry Level Stewardship (OELS). This sector plan does not specifically encourage dairy farmers to convert from conventional to organic methods, but organic dairy farmers will be encouraged to enrol in OELS.

would check whether there are any specific positive or negative factors that have affected the level of applications from dairy farmers. We want to refine the schemes to make them more accessible for farmers, without compromising environmental benefit.

D. Provide targeted compliance assistance and integrated advice

It is important that people who support and advise farmers are sensitive to the various challenges they face. To meet Water Framework Directive requirements and help the Government deliver its programme for Catchment Sensitive Farming (CSF), we are working with the Catchment Sensitive Farming delivery partners to support the creation of Catchment Sensitive Farming Officers. We will also work with other stakeholders to deliver consistent, practical and helpful advice to dairy farmers to help them comply with regulations and improve environmental performance. We have already had a number of discussions with organisations and companies about giving advice and information to dairy farmers.

The Environment Agency will target its compliance and enforcement efforts on the farms and specific agricultural practices that put the environment at most risk. The Environment Agency's visits to dairy farms will be integrated (they'll cover all relevant environmental regulations), and they will emphasise problem-solving and environmental results.

This approach will help boost compliance with NVZ and other environmental regulations. It will also reduce environmental impacts. It should help ensure that dairy farmers are assured of getting their full Single Payment. A range of integrated advice will help to improve all areas of dairy farm environmental performance.

E. Delivery and communications

Communication is a strong focus of the plan. There are no magic solutions to addressing environmental problems in a cost effective way and the best solutions will vary from farm to farm. However, recognising the challenges and some of the broad ways they can be addressed is a sound basis for action. This report plays an important role in this wider communication. It is a way of engaging with a wider group of people who spend time going down farm tracks and can deliver messages to producers. These people include feed and input manufacturers, consultants, environmental groups and milk buyers.

Going further, it is vital that implementing this plan leads to effective change at farm level. We have written a fact sheet for farmers that summarises the issues this plan raises. However the most effective way of communicating with farmers is in person. We can only do this effectively if there are co-ordinated and consistent messages from the different organisations that deliver these messages to farmers.

The stakeholder groups that will implement the plan has an important role in ensuring co-ordination, progressing the initiative and maintaining the momentum behind the plan that will be necessary to secure improvement on farms. In Wales, it has been agreed that implementation will be through the Wales Dairy Strategy group.

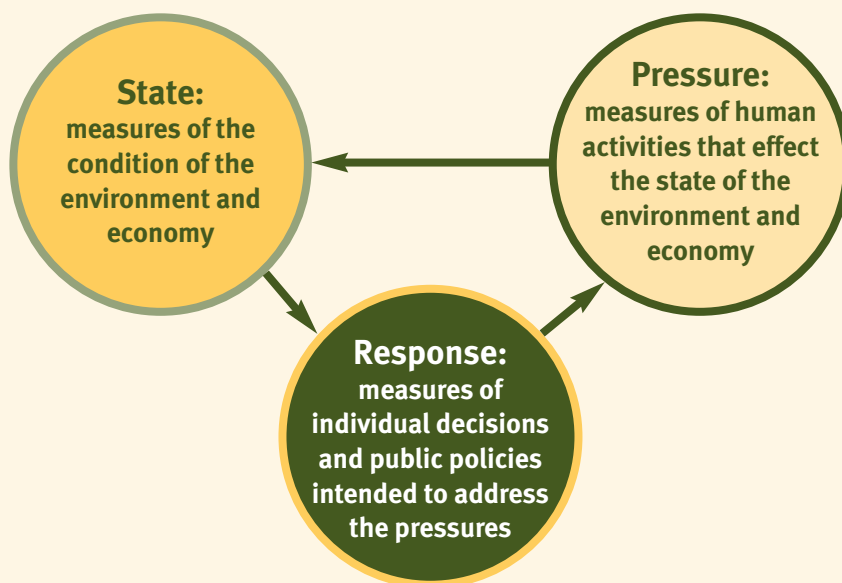
Evaluation and review

We intend to review the progress of the plan regularly. There will be an evolutionary learning process for everyone on aspects such as developing and reporting against indicators, tasks and milestones. Early review and revision will be appropriate following the first learning cycle. Some of the possible indicators that could be used are listed under Annex A.

Annex A: Measuring Success

This plan uses a pressure-state-response model to evaluate performance. “State” indicators describe the state of the environment or the economy. “Pressure” indicators are used to measure aspects and impacts that affect the state of the environment and economy. “Response” indicators assess the uptake of certain responses that are aimed at reducing the impact of those pressures on the state of the environment or economy.

Figure 4. Simplified pressure-state-response (PSR) model



In all cases, this plan aims to use indicators of performance for which data are already collected and readily available. The available data are not always ideally suited to the purposes of this plan, but it is important not to impose new burdens on dairy farmers or to rely on data that cannot be efficiently gathered.

For most of the indicators, performance can be measured in a variety of ways. For example, we can track the number of farms taking a specified action, the percentage of farms doing so, the amount of land or cows managed by those farms, etc. Details of precisely what we will track are yet to be determined.

State Indicators

Because “state” indicators describe the condition of the ambient environment, they are the ultimate measure of whether progress is being made and objectives are being met. Not surprisingly, these are the indicators of greatest interest to the public as a whole. This Annex identifies some of the key state indicators that are particularly relevant to the dairy sector. All will be routinely tracked as part of larger efforts to monitor UK progress toward sustainable development. However, we must always remember that other sectors contribute to the state of the environment. In fact, for some indicators (especially those related to air quality and climate change) the contribution of the dairy sector to the overall state of the environment is very small. A state indicator might hypothetically go in the wrong direction even if the dairy sector does an excellent job managing its environment impacts, because of the contributions of other sectors. Therefore, the state indicators listed below are not particularly relevant for evaluating the success of the dairy sector plan and are not noted in Section 6 of the plan.

Indicators of Performance	Related Objectives
Chemical River Water Quality (UK Government Headline Indicator)	1
Biological River Water Quality (UK Government Headline Indicator)	1
Nitrate Concentrations (UK Government Indicator)	1
Phosphate Concentrations (UK Government Indicator)	1
Water Framework Directive Good Ecological & Chemical Status	1
Populations of Wild Birds (UK Government Headline Indicator)	iii
Concentrations of Organic Matter in Agricultural Topsoils (UK Government Indicator)	2
Air Quality (UK Government Headline Indicator)	ii
Income Data from Farm Business Survey	3

Pressure Indicators

These indicators refer specifically to pressures on the state of the environment that are caused by dairy farming. For example, net greenhouse gas emissions in this context refers only to the emissions from dairy farming. The basic premise is that improvements by the dairy sector on the pressure indicators can help lead to improvements in the state indicators, if other sectors also improve or at least maintain their performance.

Indicators of Performance	Related Objectives
Pollution Incidents	1,2,4
Cross-Compliance Rate	1,2,3,4
Compliance Rate – NVZ	1,4
Compliance Rate – SSAFO	1,4
Slurry Storage Capacity	1,2,3,4
Fertiliser Use	1,2,3
Pesticide Use	1,2,3
Fly Tipping Complaints	3,5
Net Greenhouse Gas Emissions (UK Government Headline Indicator)	ii
Biodiversity Monitoring – Future Indicator	iii
River Bacterial Quality – Future Indicator	1

Response Indicators

This plan identifies many actions that the key stakeholders will jointly promote and encourage as appropriate responses to the sector's highest priority environmental challenges. The indicators below will measure whether those responses actually happen. This means these response indicators are the ones most likely to be directly influenced by the sector plan. The underlying assumption is that if dairy farmers and other stakeholders make these responses in large numbers, this will lead to improvements in some of the high priority pressure indicators and in turn to improvements in the state indicators.

Future versions of this sector plan are likely to emphasise new joint priorities and responses. In addition, each of the stakeholders individually will continue to work on a wide variety of environmental issues and responses that are not identified as joint priorities. The key point is to recognise that the sector plan represents a shared plan for addressing the highest priorities together. It is not a comprehensive summary of everything being done to improve environmental performance in the dairy sector.

Indicators of Performance	Related Objectives
Total ELS Enrolment	1,2,3
ELS Enrolment w/specified resource protection options	1,2,3,4
Use of Nutrient Management Plans	1,2,3,4
Use of Manure Management Plans	1,2,3,4
Use of Soil Management Plans	1,2,3,4
Use of Crop Protection Management Plans	1,2,3,4
New Slurry Storage Capacity Installed	1,4,5
Participation in Waste Recovery/Recycling Schemes (if established by government or private sector)	
Biofuels Production/Digester Output	3
Electricity Generated from Renewables	3
ISO/EMAS Certifications	4
Whole Farm Appraisals Completed	4
LEAF Participation	4
Number of Catchment Advice Officers	5
Number of Joint Appearances, Publications, and Training Sessions (Environment Agency and Dairy Sector groups working together)	5
Measure for evaluating communications success – to be determined	5

Environment Agency
enquiries@environment-agency.gov.uk
www.environment-agency.gov.uk
0870 8506506

NFU
nfu@nfu.org.uk
www.nfuonline.com
02476 858500

Royal Association of British Dairy Farmers
office@rabdf.co.uk
0845 458 2711

Milk Development Council
info@mdc.org.uk
www.mdc.org.uk
01285 646500

Dairy UK
www.diaryuk.org
0207 486 7244



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