

A vision for sustainable agriculture

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Sustainable
Development Commission



a vision for sustainable agriculture
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farming and food

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Sustainable food and farming – our view

Why another definition of sustainable agriculture?

1. In the wake of BSE and the foot and mouth crisis, the language of sustainable development has moved firmly into the food sector. When we look at the food on our plate, whether at home or in a catering establishment, how much do we know about the way it was grown, processed, distributed and retailed? What have been the environmental and social costs and benefits at each stage? Whether the food product started its life in the UK or overseas, we need a better understanding of the impact of our consumption on such issues as energy use and pollution, biodiversity, rural communities and other sustainable development issues.
2. The Sustainable Development Commission (SDC) is uniquely positioned to suggest a more coherent view of sustainable food and farming than has so far been developed. We are an independent advisory body, set up by the Prime Minister to promote the delivery of sustainable development across all sectors of society. A major part of our role is to scrutinise the Government's policies and judge how far they promote sustainable development.
3. This paper is the first stage in our work on sustainable food production, and is intended to inform the Policy Commission on the Future of Farming and Food. The remit of the Farming and Food Commission is limited to England; but we believe the same broad objectives should also underpin future policy in Wales, Scotland and Northern Ireland. We have also developed an appraisal tool which will be used to assess policy proposals against a set of sustainability criteria. This assessment will include analysis against the Government's own sustainability indicators.

What is sustainable agriculture?

4. As used, the term "sustainable agriculture" or "sustainable farming" has embraced a wide range of issues and objectives, including the role of farming in rural communities; the need for greater protection of the environment; concerns about rural land use; animal welfare; development of local food markets; and the need for farming to support other sectors of the economy, such as tourism.
5. SDC defines sustainable agriculture as agriculture that contributes to the overall objectives of sustainable development – to meet the needs of the present without compromising the ability of future generations to meet their own needs.ⁱ The objectives and mechanisms below develop this definition further.

The scope of the task

6. Although its direct economic significance has diminished in recent years (contributing only 4 per cent of GDP in rural areas of England), farming remains a hugely important activity to the character and culture of the UK. Farming shapes over 70 per cent of our landscape, a higher proportion than any other OECD country.ⁱⁱ The rural landscape created by farming activities creates the physical conditions necessary for the success of other sectors, especially tourism, and has important impacts on recreation and enjoyment. Farming also has impacts on our health, through the nutritional quality of the produce which reaches our tables. What happens on farms has major implications for both our local and global environments.
7. Equally, the impact of the food sector on our lives is not by any means limited to what happens on farms. The diagram below simplifies the complex set of relationships which underpin our food production and

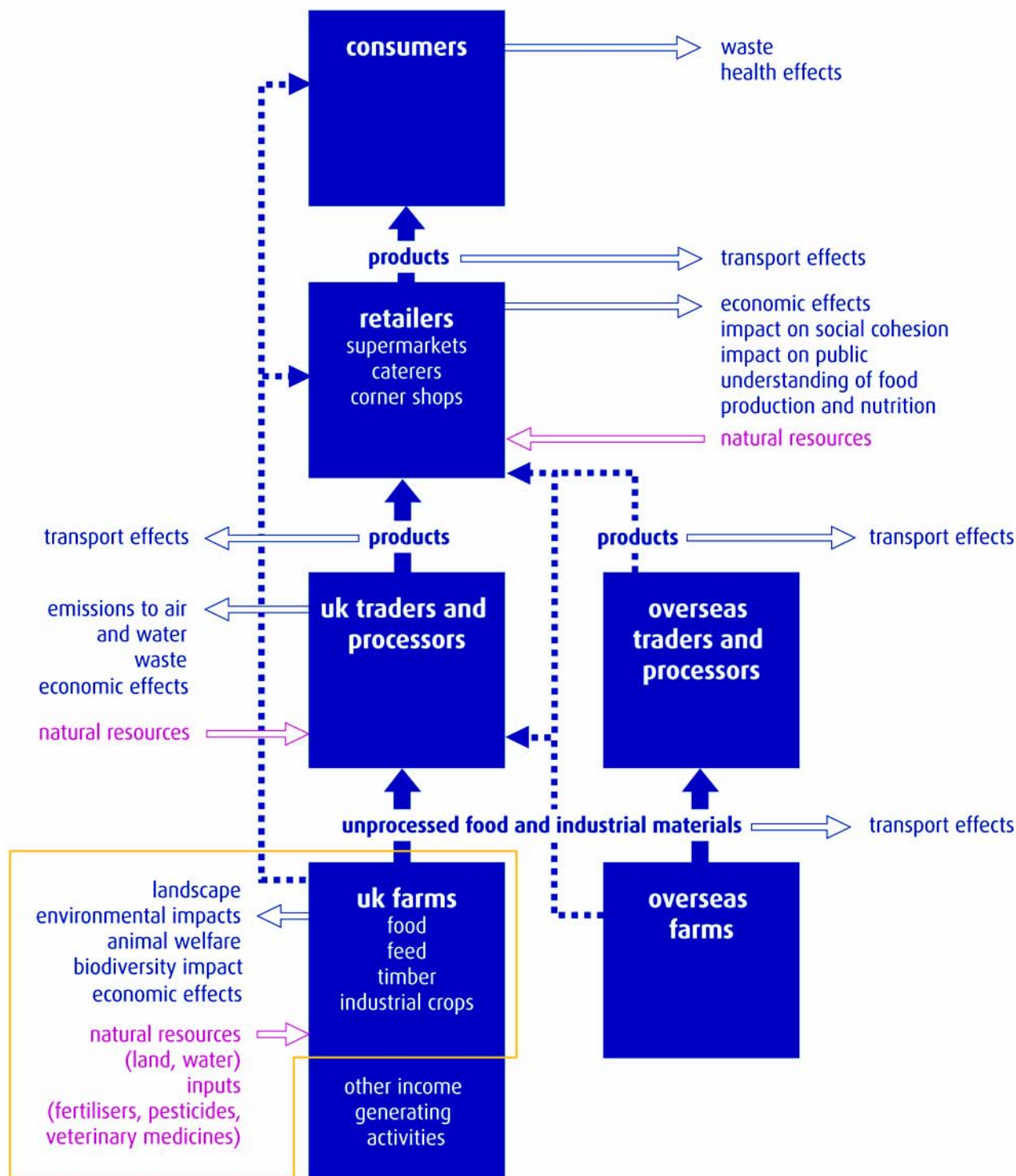
consumption. Power to change rests at many points along the food chain, and it is important not to underestimate the role of consumers – whose choices determine the viability of alternative agricultural practices – and retailers – whose buying policies shape the choices available to those consumers, and also the activities of farmers.

8. We also need to be aware that in food, as in so many other sectors, the UK has a complex set of production and consumption relationships with overseas producers and consumers, which are determined by international obligations such as the Common Agricultural Policy (CAP) and World Trade Organisation (WTO) regimes. Many of the outcomes which we want to see in a truly sustainable food production sector will depend on negotiated changes to these agreements, and we do not underestimate how difficult this would be to achieve. But we have deliberately not excluded these issues of WTO and EU compliance from our analysis, as our objective is to offer government a complete picture of what long term policy direction should be.
9. Sustainability is an issue which arises at many points along the food chain. It is not only the production of food, but also its transport and processing which determines its sustainability. The amount of food transported on UK roads increased by 20 per cent from 1978 to 1998, and the distance travelled increased by 50 per centⁱⁱⁱ. There is a clear need for greater analysis of the social and environmental impacts of these trends, which we will be addressing at a future point in our work programme.
10. But to start with, SDC is focusing its attention on the narrow issue of the sustainability of agriculture in England. The scope of this paper is to assess the environmental, social and economic impacts of the business of producing food, feed and other crops on farms; the food and non-food benefits which this activity generates for society; and the policy measures needed to ensure these benefits are effectively delivered.

Sustainability issues in agriculture

11. The Organisation for Economic Co-operation and Development (OECD) estimates that world agri-food production will have to double in the next half century in order to meet increased demand for food – “the challenge is whether agricultural activities can efficiently and profitably produce food to meet that growing demand over time without degrading natural resources and do so in socially acceptable ways.”^{iv}
12. Many people believe that the way in which we produce food in this country does not currently meet this challenge. Environmental concerns about the farming industry are far from new. Debate has raged for many years over issues such as energy emissions, removal of hedgerows, nitrates in groundwater and pesticide use.
13. But, in 2001, worries over environmental impacts have been matched by acute concern over the economic viability of the farming sector, and the implications of this for the social sustainability of rural areas. In 2000 farm incomes in the UK dropped to the lowest level since records began.^v The impact of foot and mouth disease has created a new imperative to establish a firmer basis on which farmers can make a decent livelihood from farming and looking after the land.
14. The following text sets out objectives and mechanisms which we believe should underpin the development of detailed policies for the future of the farming sector in England, and which we believe should also be applied in Wales, Scotland and Northern Ireland.

A simplified outline of the sustainability impacts of the food chain, showing the scope of this paper



- major flow
- other flow
- impacts
- inputs
- scope of paper

Objectives for Sustainable Agriculture

15. How should agriculture contribute to sustainable development? By meeting all the objectives below at the same time, agriculture could make a major input to a sustainable economy and society.

Box 1: Objectives for sustainable agriculture

Sustainable agriculture must:

- Produce safe, healthy food and non-food products in response to market demands, now and in the future
- Enable viable livelihoods to be made from sustainable land management, taking account of payments for public benefits provided
- Operate within biophysical constraints and conform to other environmental imperatives
- Provide environmental improvements and other benefits that the public wants - such as re-creation of habitats and access to land
- Achieve the highest standards of animal health and welfare compatible with society's right of access to food at a fair price
- Support the vitality of rural economies and the diversity of rural culture
- Sustain the resource available for growing food and supplying other public benefits over time, except where alternative land uses are essential in order to meet other needs of society.

What do these objectives mean in practice?

Produce safe, healthy food and non-food products in response to market demands, now and in the future

16. In the broad-ranging public debate about the farming sector, it is too easy to forget that its central mission remains the production of food. We believe that the agriculture industry must regain the public's trust over the safety and quality of food. This means tackling head-on issues such as pesticide residues in food and use of veterinary medicines, particularly antibiotics.
17. Many food safety problems can be tackled at farm level. Intensive rearing of poultry and pigs is partly responsible for food poisoning bacteria such as salmonella and campylobacter. The widespread use of antibiotics on livestock impacts upon human health as bacteria develop resistance. Risk of E.coli may be reduced by changing the diets of animals.
18. It is particularly important to ensure that market interventions by the government have the effect of encouraging producers to deliver food that consumers actually want. Subsidies should not encourage production of goods for which there is little or no demand. However, there is a role for subsidies in ensuring that consumer needs are met – the market may not deliver all the food that people need at an affordable price.
19. Better nutritional standards are key to the future health of people in England. A healthy diet depends upon eating a balance of foods, and on those foods being processed, stored and prepared in ways that retain their nutritional value. But do growing and selection methods influence the nutritional value of food? And is nutritional content affected by long distance transport and

storage? We are considering research on these issues later in our work programme.

Enable viable livelihoods to be made from sustainable land management, taking account of payments for public benefits provided.

20. Farmers and land managers need to be able to make an acceptable livelihood. Improved co-operation is one way to increase returns. The value of food leaving the farm is a tiny proportion of the value at which it is sold in supermarkets or restaurants. One way to improve the profitability of farming is to increase the farmer's share of the final price of goods produced.
21. A number of initiatives are already underway to improve the profitability of farming. Box schemes and farmers' markets enable farmers to sell directly to consumers; the Countryside Agency's "Eat the View" scheme promotes locally distinctive produce. However, the majority of farmers are likely to continue to rely on conventional marketing of produce, so innovation is required here too. For example, on-farm and local processing of products could increase profitability.
22. SDC supports provision of subsidies for farming and land management, because of the public benefits provided, and also as there is not a level international playing field. Farmers here face higher land costs and social and environmental standards than competitors in many other countries, so it would be difficult to be fully financially viable without a degree of state support. In 2000, subsidies to UK farms were 30 per cent greater than the total income from farming.^{vi}

23. However, until recently payments have not been targeted at delivery of public goods. The subsidies system should not distort market signals of demand for products, nor should it simply encourage higher volumes of production. This principle is now broadly accepted in the UK, and support for farmers for providing public goods, such as environmental protection or energy crop schemes, has begun under the Rural Development Regulation. However, there is still a long way to go; rural development, business improvement and environmental payments account for only 8 per cent of subsidies paid to UK farmers by the CAP and the UK government.^{vii}

24. Farmers should be paid for providing benefits that the public wants. We would like to see subsidies paid for:

- measures that help farmers to diversify and contribute more to rural communities and economies
- protection of the character of the rural landscape
- improved public enjoyment of the landscape e.g. through provision of footpaths
- protection of the environment, above minimum standards
- positive measures to improve the environment – e.g. carbon sequestration, habitat creation, restoration of biodiversity
- flood protection
- promotion of animal welfare, above minimum standards.

For each of the benefits we think we are buying, we need to take a hard look and see whether

purchasing them via the farming sector is a cost effective use of public money. Of course, some of these benefits can only be achieved through farming.

Operate within biophysical constraints and conform to other environmental imperatives

25. Operating within biophysical constraints means not causing serious or irreversible damage to the natural resources that farming and all other human activities depend upon. This is an essential principle of sustainable development; clean air and water and fertile soils are vital for our future prosperity. Emissions to air, soil and water must not exceed the capacity of nature to neutralise harmful effects to humans and ecosystems. Box 2 below gives a summary of the environmental impacts of agriculture

26. But defining biophysical constraints is not a straightforward task – for example, what is an acceptable level of climate change? In some areas, such as soil degradation, we simply do not have sufficient knowledge to judge at which point irreversible damage is done. Respecting biophysical constraints does not mean eliminating all possible negative environmental effects. For example, we may be happy to have some rivers of low quality, provided that there are sufficient high quality rivers to meet our recreational needs and support wildlife.

Box 2: Environmental impacts of agriculture

Soil quality The soil itself should be protected from further erosion, salination, loss of organic matter and accumulation of heavy metals. Loss of organic matter from soils means increased greenhouse gas emissions as carbon is released. The

National Soil Inventory has shown that the organic content of soils is decreasing.^{viii} Soil quality is of course vital to the long-term productivity of farming.

Landscape Farming shapes much of our landscape – over 70 per cent of UK land is farmed.

Water quality and quantity Use of water for irrigation has increased dramatically over the past 20 years. Over-abstraction of water is already causing damage to ecosystems, while use of irrigation can cause soil salination over time. Surface and ground water must be protected from pollution by animal waste, cryptosporidium, pesticides, nitrates and phosphates. In 1999 agriculture was the source of 14 per cent of water pollution incidents in England and Wales. In addition to pollution incidents, agriculture also delivers low level pollutants to watercourses, such as pesticide and fertiliser run off from fields. Agriculture is also the main source of nitrogen in watercourses, which causes eutrophication.^{ix}

Air quality Farming creates dust and smells, and contributes to acid deposition. Agriculture’s contribution to acidification has become proportionally more important as other sectors have reduced emissions.^x

Climate Agriculture directly emits around 8 per cent of UK greenhouse gases. These emissions are projected to decline in the future, due to reduced and more targeted use of fertiliser, and a decrease in livestock numbers resulting from market and policy constraints.^{xi} Agriculture’s contribution is predominantly through emissions of methane and nitrous oxide.^{xii}

Biodiversity Protecting the genetic resource base, in terms of species used for food and also other life on and around farms, is essential. We must protect the current diversity of plants and animals used for food – this will ensure that food production systems are robust in the face of disease and changing environmental conditions.

Wildlife and semi-natural habitats There is a need to protect the diversity of animal and plant life associated with farming. Wildlife is important as part of the genetic resource base, and also because of its value to people.

27. In order to fully understand the environmental impacts of our food, we need to consider the whole food chain, from farm to plate. We believe that in the long term, we should aim for a food production system with a net zero impact upon climate change. Local sourcing and distribution of food may be important in low energy food production and distribution systems. In later work, we plan to look at impacts of food production and consumption, particularly in terms of energy use.

and conserving the natural resources that farming depends upon, we should restore environmental quality and deliver other benefits that the public wants, such as access to land and attractive landscapes. Where the public is prepared to pay for these, we should provide support.

29. Indeed environmental improvements, both local and global, are only a subset of the wide range of benefits which the farming sector could provide for public benefit. The examples given in box 3 below are a selection of the benefits that farmers could provide, but are not an exhaustive list.

Provide environmental improvements and other benefits that the public wants - such as re-creation of habitats and access to land

28. A steady environmental state is a very limited aspiration, particularly in view of the extent of degradation and loss of environmental quality in recent decades, exacerbated by public policy. As well as protecting the environment as it is now,

Box 3: Benefits that agriculture could provide

Biodiversity Biodiversity is not only essential to the robustness of farm and natural ecosystems, it is also a quality of life issue – songbirds, for example, have an aesthetic importance to us. Maintaining biodiversity means conserving, enhancing and

recreating habitats on and around farmland, such as wetlands, woodland, rivers and hedgerows. At an international level, it means not consuming food that degrades the environment of other countries.

Landscape Changes in agriculture, such as a large increase in forestry, cause major changes in the landscape. There is a balance to be struck between making farming competitive and creating the type of landscape the public want.

Industrial crops There is some potential for crops to provide alternatives to petro-chemical products. For example, oilseed rape can be used to produce an alternative to diesel. Bio-degradable plastics and plant-derived fuels would have environmental benefits (in that they would be less polluting than petro-chemicals, could reduce landfill and would not add to climate change) but only if these industrial crops were grown to meet the same sustainability criteria as food crops.

Carbon sequestration Farming could help reduce climate change emissions by storing carbon in soils. Planting forests may also help - but more research is needed on this.

Food security This was one of the original rationales behind a supported agriculture sector, but is widely viewed as less relevant today. However, with the prospect of climate change, it may be worth reassessing whether food security at UK or at least EU level could be a valid public policy aspiration. Food security is important both in terms of ensuring sufficient supplies for ourselves, and also in contributing to global food needs.

Access Access to land can improve people's enjoyment of the countryside.

Achieve the highest standards of animal health and welfare compatible with society's right of access to food at a fair price

30. The UK has some of the highest animal welfare standards in the world. However, long distance transport of livestock and intensive systems of farming still cause suffering, and contribute to the spread of disease. The five freedoms drawn up by the Farm Animal Welfare Council (FAWC), and used as the basis of the RSPCA's Freedom Foods scheme, define what animal welfare means:

- freedom from fear and distress
- freedom from pain, injury and disease
- freedom from hunger and thirst
- freedom from discomfort
- freedom to express normal behaviour.

31. Animal welfare legislation has posed problems for farmers, as it is more difficult for them to compete with imports from countries with lower welfare standards. WTO rules may prohibit marketing or import regulations aimed at increasing animal welfare standards – but this has not yet been tested. The difficulties of promoting higher standards within free trade rules are discussed further below.

Support the vitality of rural economies and the diversity of rural culture

32. Supporting farming as an activity has often been seen as a proxy for supporting rural communities. For many rural communities, farming is still an essential defining activity, economically and culturally. Farming creates the landscape on which other local employment (e.g. tourism) depends. It may also, less tangibly, be seen as central to the character of an area, in a way that is valued by those who live in it and visit it. SDC believes that supporting farming is therefore an important cultural objective.

33. But, in reality, farming is no longer central to many rural economies. Indeed, there is no longer a very clear picture of what a rural economy is. In rural areas of England, farming accounts for only 4 per cent of GDP.^{xiii} There is no longer a clear divide between rural and urban; more than half of those who live in the country and work, work in the town, and employment patterns are similar in rural and urban areas. The growth of communications technology will further assimilate work opportunities in rural and urban areas, as location becomes less of a barrier. These issues are recognised in the Rural White Paper, which SDC supports.

34. With the town/country boundary more fluid, and agricultural employment in long term decline, it is clear that the relationship between the health of the farming industry and the health of the rural economy is no longer as close as it once was. We believe that while the major barriers to restoring high quality agriculture employment should be tackled, this should be alongside diversification and wider rural development measures, to raise the quality of life of both farmers and rural communities as a whole.

35. That is not to say that agricultural employment should be written off. New market-driven ventures will offer benefits for workers as well as entrepreneurs. Organic farming, for example, can increase both quality rural employment as well as low skilled casual labour for the horticultural sector. Measures to revitalise the competitiveness of agriculture as a business will also increase its attractiveness as a career.

36. But agricultural initiatives must fit with the wider needs of rural economies. There is scope for the government to tackle the main barriers to progress, for example through increasing opportunities for training in rural areas, providing local infrastructure, and removing barriers in the planning system to effective diversification. Reform in these areas could increase the potential for land managers to supplement their agricultural employment with employment and income from other sources.

Sustain the resource available for growing food and supplying other public benefits over time, except where alternative land uses are essential to meet other needs of society

37. Land provides a wide range of products and services, including production of food and fibre; space for residential and commercial developments; recreation; habitats for wildlife;

and flood protection. Balancing the different uses of land is difficult, particularly since some public benefits cannot be given an economic value. However, this does not mean that they should not be fully taken into account in developing public policy initiatives for the agriculture sector.

38. We believe that there is an intrinsic value in maintaining diversity in landscapes and cultures, above and beyond the spin-off benefit of tourism. There is also an existence value to the rural landscape – people value it being there, even if they do not use it or see it themselves.

39. Balancing these benefits raises issues around land use planning and the function of rural land. Protecting the character of the countryside does not mean keeping it static. The economic viability of the countryside depends upon diversification and attracting new businesses; and rural communities must be populated to be viable. There is a need for affordable housing, to enable young people to remain in areas where they have grown up. But there is an obvious conflict here with preserving undeveloped land. The issue of rural land use requires much more study, and we plan to tackle this further on in our work programme.

How can we achieve sustainable agriculture?

40. All sorts of detailed policy measures will need to be considered, but we would advance the principles on which all measures should be based.

Box 4: Mechanisms to achieve sustainable agriculture

Effective regulation to enforce minimum standards of worker safety, food safety, environmental protection and animal welfare

Market measures such as farm assurance schemes, traceability and promotion of best practice to encourage high standards of food safety, environmental protection and animal welfare

Economic instruments (subsidies, taxes and trading regimes) that reward provision of benefits the public wants (beyond the minimum required by regulations), and discourage pollution and other disbenefits

Consistent application of the precautionary principle

Education and training for all land managers and farm workers.

Effective regulation to enforce minimum standards of worker safety, food safety, environmental protection and animal welfare

41. Good regulation is achievable, enforceable, and not susceptible to evasion; it should also be transparent, targeted and proportionate. Regulations provide minimum levels of public health protection, environmental protection and animal health and welfare.
42. Where there are practical obstacles to immediate step changes towards sustainability, clear signals should be given that these changes will be required over the medium to long term, and that the industry should start to take steps now to deliver them.
43. Higher standards can make it difficult for farmers to compete with more cheaply produced imports. The government should therefore take measures to promote the high standards of domestic producers, for example by funding promotions. Local authorities, the armed forces and other bodies could support higher domestic standards

through their own food purchasing policies. WTO rules may prohibit marketing or import regulations aimed at raising animal welfare, social or environmental standards, but this has not yet been tested. The position will not be clear until there is a challenge. This emphasises the global dimension of sustainable development. If we do not take the concept forward with other nations, tighter controls and higher standards here may simply result in exporting pollution elsewhere.

Market measures such as farm assurance schemes, traceability and promotion of best practice to encourage high standards of food safety, environmental protection and animal welfare

44. The buying policies of large retailers impact upon farming practices, and hence also upon landscapes and the environment. Identification and promotion of best practice by retailers could therefore be one way to promote more sustainable farming.
45. Numerous voluntary schemes already exist to market food on the basis of higher standards,

such as the Red Tractor logo promoted by the National Farmers Union and the RSPCA's Freedom Food scheme. Such schemes could play an essential role in providing higher environmental and animal welfare standards. They provide consumers with the choice to support higher standards or different farming practices if they wish, and so should be encouraged as another tool to achieve sustainable farming. However, these schemes must provide standards that are significantly above minimum legal standards. They must be properly regulated and inspected so that the public may have confidence in them. There must also be good communication with consumers to ensure that they understand what they are paying for.

46. In addition to these national schemes, there is also an important role for locally based and private initiatives. People may be more willing to support a local assurance scheme, as land management by local farms has a direct impact upon them. An example is Taste of the West, a limited company representing industry, public and community sectors in the south west, which is developing a brand to promote food and drink from the region.^{xiv}
47. Promoting food according to where it comes from, as Taste of the West is doing, could be an important aspect of assurance schemes. This could improve understanding of how food is produced, and provide consumers with more choices about where their food comes from and what farming regimes they support.

Economic instruments (subsidies, taxes and trading regimes) that reward provision of benefits the public wants (beyond the minimum required by regulations), and penalise pollution and other disbenefits

48. Economic instruments offer greater potential for benefits than regulations, as they give an

incentive to attain higher standards than the regulatory minimum. This would not be an appropriate way to encourage high levels of worker safety or food safety. But if used to promote higher environmental standards or to encourage rural development, it would give benefits to both land managers and the public. We should encourage use of efficient economic instruments (including trading systems as well as taxes) where possible, whilst protecting vulnerable consumers from possible negative price effects. Economic measures could also be used to encourage greater investment in technology and human resources.

49. Economic instruments can be used to address externalities, that is, when the full costs of an activity are not met by the actor. For example, the cost of removing nitrates washed into rivers from farmland is borne by water companies, not farmers. It is also possible to have positive externalities, such as an enhanced landscape created by farming. In these cases, the public can pay farmers for the externality through subsidies.
50. The "polluter pays" principle is an essential tenet of sustainability. Making the polluter pay will work best where consumers have the choice to switch to a less polluting (and hence, potentially cheaper) alternative. The incentive effects should be carefully considered before implementing taxes or fines on polluters.

Consistent application of the precautionary principle

51. This is already accepted by the Government as a guiding principle for policy. The Rio Declaration defined the principle as follows: "where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation". The term should be applied to economic, health and social

impacts as well as to the environment. The principle should be applied for example when considering release of genetically modified organisms to the environment, or when dealing with a public health risk like BSE.

52. The precautionary principle has been interpreted differently by different people. There is rarely such thing as definitive scientific evidence of safety; but how is acceptable risk defined?

Education and training for all land managers and farm workers

53. Investing in the development of skills for land managers and farmers is key to raising performance and improving competitiveness. Training in business management, land management, animal welfare and environmental protection should be made available to all land managers and farm workers. As well as improving profitability, such training would help land managers provide more of the benefits that the public wants. In addition to traditional training, we should consider making farming a "profession", with continuing professional development. This could also help attract more young people into farming. We should learn from the Australian Landcare scheme, which uses farmer co-operation and community involvement as the means for better management of natural resources.

Conclusions

54. The objectives developed above aim to address the full range of economic, social and environmental issues around sustainable agriculture. However, in applying these objectives there are a number of conflicts to be resolved. How do we balance conserving the character of the countryside with providing the infrastructure and accommodation required for rural areas to thrive? To what extent should the taxpayer pay farmers to protect the environment?

How can we have effective environmental, food safety and animal welfare standards that comply with free trade rules, without severely disadvantaging farmers? We do not yet have all the answers to these questions; but we hope that by providing a clearer picture of what sustainable agriculture should look like it will be possible to assess the sustainability of different policy proposals.

- ⁱ World Commission on Environment and Development (1987) *Our Common Future* (The Brundtland Report)
- ⁱⁱ OECD (2001) *Improving the Environmental Performance of Agriculture: Policy options and market approaches*
- ⁱⁱⁱ Sustain (1999) *Food Miles – Still on the road to ruin?*
- ^{iv} OECD (2001)
- ^v MAFF (2001) Provisional estimate of UK farm incomes in 2000
<http://www.maff.gov.uk/esg/Work.htm/Notices/account.pdf>
- ^{vi} MAFF, SERAD, DARDNI and NAWAD (2000) *Agriculture in the UK* tables 6.1 and 9.1
- ^{vii} MAFF, SERAD, DARDNI and NAWAD (2000) table 9.1
<http://www.defra.gov.uk/esg/work.htm/publications/cf/auk/current/9-1.xls>
- ^{viii} MAFF (2000) *Towards Sustainable Agriculture: A Pilot Set of Indicators*
- ^{ix} Environment Agency (2000) *Water Pollution Incidents in England and Wales 1999*
- ^x ONS (2000) *UK Environmental Accounts*
http://www.statistics.gov.uk/nsbase/themes/environment/articles/environmental_accounts.asp
- ^{xi} DETR (2000) *Climate Change - The UK Programme* p113-114
- ^{xii} MAFF (2000)
- ^{xiii} DETR (2000) *White Paper - Our Countryside: The Future* <http://www.wildlife-countryside.dtlr.gov.uk/ruralwp/cm4909/index.htm>
- ^{xiv} <http://www.tasteofthewest.co.uk/index.htm>