

Wildlife and Countryside Link Position Statement on Food Security

December 2012

Executive summary

Wildlife and Countryside Link (Link¹) believes that food must be produced in a way that protects and enhances the natural resources on which its production depends. How much food is needed will depend on a range of factors including population increases, changing diets and consumer choice. The challenge is to work towards a healthy, sustainable diet for everyone. However, it is also important to understand that increased production also does not automatically lead to less global hunger. The number of undernourished people in the world has increased by 9% despite a 12% rise in global food production per capita since 1990². This suggests the most pressing issue is to address issues of global poverty and access to food rather than just to increase the amount of food available.

Link member organisations believe that creating and maintaining a high quality natural environment is critical for our food production capacity. It is vital that we protect the productive base of agriculture – the environment and its resources.

Link believes that the following ten actions and interventions will help to deliver sustainable, sufficient and secure supplies of food for everyone in the future:

- i. The farmers, landowners and food producers creating and maintaining a high quality natural environment need to be properly rewarded for the provision of 'public goods'
- ii. Government policies must ensure that food production in the UK is environmentally sustainable and must not promote increases in production where this damages or degrades the environment, human well-being or animal welfare
- iii. Agri-tech solutions to increasing food production, including genetic modification (GM), should not be promoted at the expense of developing and implementing agro-ecological approaches
- iv. Taking land out of production for conservation or flooding should be recognised as providing important environmental benefits
- v. The EU should lead the way in developing and implementing sustainable responses to climate change in agriculture
- vi. The CAP should be reformed to create a European Sustainable Land Management Policy that supports the delivery of environmental public goods across Europe.
- vii. Steps should be taken by the EU and the Government to prevent biofuel production damaging the environment and contributing to increases in the price of food

¹ Wildlife and Countryside Link (Link) brings together 40 voluntary organisations concerned with the conservation and protection of wildlife, countryside and the marine environment. Our members practise and advocate environmentally sensitive land management, and encourage respect for and enjoyment of natural landscapes and features, the historic environment and biodiversity. Taken together our members have the support of over eight million people in the UK and manage over 750,000 hectares of land.

² Barrett C (2010), 'Measuring Food Insecurity', *Science*, 327, 825–828

- viii. Introducing measures to reduce food waste should be made a priority
- ix. Steps should be taken to encourage more sustainable diets to address the environmental issues arising from food consumption.
- x. The benefits of extensive grazing systems should be given greater recognition and support by policy makers and the food industry

This document is supported by the following Link member organisations:

- Bumblebee Conservation Trust
- Butterfly Conservation
- Campaign to Protect Rural England
- Friends of the Earth
- Plantlife
- Royal Society for the Protection of Birds
- The Wildlife Trusts
- Wildfowl and Wetlands Trust
- Woodland Trust
- WWF-UK

1. Introduction

In recent years there has been a growing debate on the future of food production. Questions have been asked about whether it will be possible to increase food production while avoiding further damage to the environment. Wildlife and Countryside Link (Link) believes that food must be produced in a way that protects and enhances the natural resources on which both its production and wildlife depend. How much food we need to produce will depend on a range of factors including population increases, changing diets and consumer choice. We need to work towards a healthy, sustainable diet for everyone. This document sets out Link's views on how this might be achieved.

2. Background

Between 2006 and 2008, international prices for basic food commodities increased by 60%. Farming and food production became a topic for discussion at all levels and interest has been intensified by projections that the global population will increase from the current 6.8 billion to 9.1 billion by 2050³ and then peak at 9.22 billion people at or around 2075⁴. A recent report by The Food and Agriculture Organisation (FAO) suggests that if current patterns in food consumption persist, global food production will need to increase by 60% by 2050 (compared to 2005-07)⁵. However, this increase is not uniform and demand may be concentrated in developing countries where the majority of population growth is likely to take place. There may be a doubling of demand for meat and dairy products in some developing countries and global cereal production is projected to increase by 50%, with almost half used as animal feed.

However, as the Soil Association highlights⁶ the FAO predictions are based on current trends and projections for increased prosperity. They therefore predict what is most likely and not what is most desirable or sustainable. Projected increases in meat demand would result in an extra one billion beef and dairy cattle which would produce significant amounts of greenhouse gas emissions and drive protein feed production even further, almost certainly at the expense of previously uncultivated land, much of it valuable as wildlife habitat and for carbon sequestration.

Whilst the world will need to address the challenge of feeding a growing population, *what* people choose to eat in the future, whether in developed or developing countries, will have a significant impact on the amount of extra food required.

However, increasingly the debate is becoming focused on addressing future 'food shortages', inevitably leading to a worrying conclusion that the logical response is simply to produce more and more food.

The UN World Food Summit (1996) defines food security as "when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life"⁷.

Food security is therefore about more than the amount of food produced. It concerns the affordability of food, access to it and dietary choices. Simply maximising

³ <http://www.un.org/apps/news/story.asp?NewsID=13451>

⁴ <http://www.un.org/esa/population/publications/longrange2/WorldPop2300final.pdf>

⁵ FAO 2012. *Towards the Future We Want: End hunger and make the transition to sustainable agricultural and food systems*. Downloaded from <http://www.fao.org/news/story/en/item/146179/icode/>:

⁶ Soil Association (2010) Telling Porkies: The big fat lie about doubling food production. Downloaded from <http://www.soilassociation.org/LinkClick.aspx?fileticket=qbavgJQPY%2Fc%3D&tabid=735>

⁷ <http://www.who.int/trade/glossary/story028/en/>

production in the UK and Europe is unlikely to address these issues. In 2009, the UN and World Bank-sponsored IAASTD report (International Assessment of Agricultural Knowledge, Science and Technology for Development) was published⁸. This comprehensive and peer reviewed report highlighted how conventional, resource intensive farming was fundamentally unsustainable and focussing solely on increased production was not a long term solution to food security, particularly in a developing country context. Instead, IAASTD emphasised the importance of supporting agro-ecological farming methods (which place equal emphasis on providing non-food ecosystem goods and services), improved research into traditional techniques and the role of women in farming.

There is no immediate shortage of food in terms of total production. The world currently produces some 4800 kcals per day per head which is more than twice our average needs⁹. However, food price increases have made food less affordable for those on low incomes. One billion people are going hungry now because of lack of access to food – either the means to grow it, or the means to buy it.

There are a complex set of reasons why food prices may increase, including:

- Short-term supply problems caused by bad harvests, for example due to drought or flooding in key food production areas. These trends are likely to be exacerbated due to climate change;
- “Panic reactions” from key food producing countries that impose export bans and tariffs in order to buffer their own consumers from price increases (but at the expense of those countries depending on imports);
- Speculation on the commodities market;
- High energy prices (modern agriculture depends heavily on fossil fuels for fertilisers, pesticides, machinery and transport);
- A change of policy by Governments towards maintaining low and declining levels of food stocks;
- Changing consumption patterns in many Asian countries (more meat and dairy consumption leading to much higher use of cereals for feed);
- Policies promoting the use of agricultural land for the production of biofuels;
- Falling support for agricultural research and development since the 1970s and a corresponding fall in the rate of productivity gains.

Increased production also does not automatically lead to less global hunger – the number of undernourished people in the world has increased by 9% despite a 12% rise in global food production per capita since 1990¹⁰. This suggests the most pressing problem is to address issues of global poverty and access to food rather than just to increase the amount of food available.

Governments should work collectively to address global food and trade issues to ensure food security for all. This would include those related to investments, land rights and tenure. People who wish to produce food sustainably need to have access to land and to appropriate technologies for the farming systems they use, including those used by the lowest income communities. Many of these issues are the subject of discussions at the UN Committee on Food Security.

⁸[http://www.agassessment.org/reports/IAASTD/EN/Agriculture%20at%20a%20Crossroads_Synthesis%20Report%20\(English\).pdf](http://www.agassessment.org/reports/IAASTD/EN/Agriculture%20at%20a%20Crossroads_Synthesis%20Report%20(English).pdf)

⁹Hans Herren, in C. Tudge (2012). Enlightened Agriculture: A people's takeover of the food Supply. *Food Ethics Council Magazine*, Summer 2012. Downloaded from http://www.foodethicscouncil.org/system/files/summer2012_web.pdf

¹⁰ Barrett C (2010), 'Measuring Food Insecurity', *Science*, 327, 825–828

3. What is required to ensure sufficient, secure supplies of food?

Link member organisations believe that creating and maintaining a high quality natural environment is critical for our food production capacity. It is vital that we protect the productive base of agriculture – the environment and its resources.

The conservation of water resources and soil fertility, along with a reduction in greenhouse gas emissions, is crucial to enable lasting productivity. Well-functioning ecosystems associated with farmland provide a number of agro-ecological services (e.g. pest control, pollination, nutrient cycling) which support crop production¹¹. A highly connected network of wildlife habitats is needed to maintain healthy populations of species that contribute to agricultural productivity as well as helping other species to survive in intensively cultivated agricultural landscapes and in a changing climate¹².

Protecting our biodiversity, soil and water resources for the long term is therefore critical to enhancing the resilience of agriculture to changes in climate, impacts of existing and future plant and animal diseases and fluctuating prices in global markets.

3.1 Key Actions and interventions

Link believes that the following ten actions and interventions will help to deliver sustainable, sufficient and secure supplies of food for everyone in the future:

i) The farmers, land owners and food producers creating and maintaining a high quality natural environment need to be properly rewarded for the provision of ‘public goods’

Link believes farmers, land owners and food producers should be financially supported to produce environmental goods and services for which there is no conventional market, and where existing legislation does not guarantee their protection and provision. These ‘public goods’ can include ecosystem goods and services like water quality and clean air as well as biodiversity and beautiful landscapes. As the current market system does not attach an economic value to public goods farmers have little incentive to supply them¹³. There is therefore a clear role for governments to intervene and support the provision of ‘public goods’ (e.g. acquiring and managing nature reserves), pay for the supply to be increased (e.g. through agri-environment payments to farmers) or guarantee delivery through regulation (obligations arising from the Nitrates directives are one example).

Link does not believe public money should be directed towards simply supporting food production. During the 1980s CAP subsidies led to huge surpluses, which were either destroyed or dumped onto poor countries’ markets at prices which were below production costs. This dumping, combined with import tariffs, contributed to keeping millions of poor farmers in poverty and prevented the development of productive

¹¹ UK National Ecosystem Assessment (2011) <http://uknea.unep-wcmc.org>, 2011.

¹² Cardinale, B.J., Matulich, K.L., Hooper, D.U., Byrnes, J.E., Duffy, E., Gamfeldt, L., Balvanera, P., O’Connor, M.I., and Gonzalez, A. (2011) The functional role of producer diversity in ecosystems. *American Journal of Botany*, 98; 572-592. and Isbell, F., Calcagno, V., Hector, A., Connolly, J., Harpole, W.S., Reich, P.B., Scherer-Lorenzen, M., Schmid, B., Tilman, D., van Ruijven, J., Weigelt, A., Wilsey, B.J., Zavaleta, E.S., and Loreau, M. (2011) High plant diversity is needed to maintain ecosystem services. *Nature*, 477: 199-202.

¹³ DEFRA (2012) The Green Food Project. <http://www.defra.gov.uk/publications/2012/07/10/pb13794-green-food-project/>.

agriculture in many countries. As a result, these countries failed to cope when imported food costs increased. The policy which encouraged maximum production levels also contributed to massive environmental problems across much of Europe, including biodiversity declines (such as farmland birds), the loss of landscape features and soil and water degradation.

ii) Government policies must ensure that food production in the UK is environmentally sustainable and must not promote increases in production where this damages or degrades the environment, human well-being or animal welfare

Although the world is not currently running out of food, regular calls are being made for UK farmers to produce as much as possible. Often this is framed as a 'moral duty' to help feed a growing population. But the reality is that the UK will not be able to contribute significantly to increased food supplies by 2050.

It is suggested that in order to accommodate a growing global population average cereal yields would need to increase. In the case of wheat, projected demand would require average global yields to increase from 2.6 to 3.5 tonnes per hectare over the next 25 years¹⁴. In 2009, average wheat yields in the UK were already 7.9 tonnes per ha¹⁵. Increasing this exceptional efficiency may still be achievable but the productive capacity of the UK is tiny in global terms: The UK holds only 0.34% of the world's agricultural land and is responsible for 0.8% of global cereal production. Increasing productivity in a sustainable way in the countries or regions where increased demand is concentrated could have a more useful overall impact on global food supplies in the future, and on the food security of the people living in those countries.

Domestically, it is essential that the UK continues to grow food, both to secure local supplies and to play a role as part of a stable global economy. However, there is little rationale for immediately pursuing maximum production levels and disregarding the other roles agricultural land performs, as the net impact on global food supplies would be negligible and the environmental consequences considerable. Such an approach would lead to continued depletion and degradation of our soils and water, habitat loss and further biodiversity declines and may not always be profitable for farmers. If we are concerned about future population growth, it makes more sense to protect our land's productive capacity by maintaining it in good environmental condition than to prioritise increasing yields.

In terms of animal welfare, the increase in production over the past few decades was possible due to the intensification of farming, which in some cases has had negative welfare consequences. For example, average milk yield of a dairy cow in the UK increased from 5787 litres per annum to 6908 litres over a ten year period to 2007. At the same time, herd sizes grew, whilst total dairy cow numbers dropped from 2.4 million to 1.9 million. Parallel to this rise in production, there have been increasing levels of mastitis and lameness in dairy cows. Within the poultry meat industry, the growth rate for chickens bred for poultry meat has increased dramatically over the past four decades, resulting in a decreased age for chickens to reach their slaughter weight of 2 kgs from 80 to 40 days in the 30 years from 1977 to 2007. This has been associated with increased rates of welfare problems in chickens from the faster growing breeds¹⁶. Clearly any increase in production must not lead to increased welfare problems for farm animals.

¹⁴ Ortiz et al, Climate change: Can wheat beat the heat? *Agriculture, Ecosystems and Environment*, Vol. 126 (2008) 46-48

¹⁵ Defra (2008) Agriculture Statistics

¹⁶ RSPCA 2006 Everyone's a winner.

<http://www.rspca.org.uk/ImageLocator/LocateAsset?asset=document&assetId=1232712783750&mode=prd>

iii) Agri-tech solutions to increasing food production, including genetic modification (GM), should not be promoted at the expense of developing and implementing agro-ecological approaches

GM technology is regularly championed as an essential tool in meeting the need to produce more to feed the growing global population. Biotechnology interests have used the food security argument to press governments to introduce less restrictive policies on the use of GM technology and streamlined approvals of GM crops¹⁷.

GM technology, accompanied by plant breeding techniques and intellectual property rights frameworks, tends towards selecting and developing a small number of crop varieties. This reduces the diversity in the genetic resource 'library' of crop traits. However, it is likely that such diversity will be essential in the future to cope with specific local conditions or future challenges¹⁸, such as climate change. Additionally, there is also evidence that genes in GM crops can be transferred to wild relatives, which drives a concern that 'superweeds' can be formed by the hybridisation of GM herbicide-resistant crops with their wild relatives¹⁹.

The development of crop varieties that are able to respond to challenges such as drought or saline soils, or which confer nitrogen fixing ability to crops such as wheat, thus reducing the need for fertiliser, could help increase production by allowing production on currently unproductive land. However, such varieties are yet to reach the market. Furthermore, there are concerns that due to the cost of GM seed and associated agri-chemicals, GM technology is likely to be inappropriate for many farmers in developing countries who farm in low-cost, low-input, small-scale agricultural systems. Agricultural research should address the need to increase crop yields in a sustainable way by developing innovations and technology appropriate to the scale and economic circumstances of these agricultural systems²⁰.

In conclusion, although in the future GM crops may play a role in helping meet the challenge of global food security, they are not a silver bullet and there are existing alternatives (such as changes to farming practices) which help to address this challenge whilst also providing multiple benefits at lower costs and with fewer risks²¹.

iv) Taking land out of production for conservation or flooding should be recognised as providing important environmental benefits

There are several reasons why keeping pockets of land out of production is vitally important. Arable land (and indeed many areas of grazing land) in the UK is in general very intensively farmed and space for nature has been steadily eroded over the past 35 years. Keeping areas of land out of production for longer periods (non-rotational/permanent set-aside) can allow comparatively rich plant communities to

¹⁷ ISAAA Brief 41-2009: Executive Summary, Global Status of Commercialized Biotech/GM Crops: 2009 The first fourteen years, 1996 to 2009

¹⁸ IAASTD: International Assessment of Agricultural Knowledge, Science and Technology for Development. 2009. Agriculture at a Crossroads: Synthesis Report

¹⁹ Plantlife (1999) Genes, crops and superweeds.

http://www.plantlife.org.uk/publications/genes_crops_and_superweeds/.

²⁰ IAASTD. idib

²¹ Tried and tested examples include the use of traditional crop varieties/ landraces, and a plethora of organic and locally-adapted low-technology farming techniques. Such solutions may have multiple benefits: most GM crops are designed to address one specific problem (e.g. drought tolerance), whereas changes in practice may have multiple benefits (e.g. the UN estimates that organic farming techniques that build soil fertility and structure could increase crop yields in Africa by 2 – 4 times while building up levels of natural, human, social, financial and physical capital in farming communities (see http://unctad.org/en/docs/presspb20086_en.pdf))

develop²², support richer communities of invertebrates²³ (such as pollinating insects) and help protect vulnerable soils (i.e. on steep slopes) from erosion²⁴. Areas that are uncultivated for much shorter periods, i.e. over-winter stubbles and spring/summer fallow, can also provide valuable nesting and feeding sites for a range of farmland birds.

Managed realignment (the controlled removal of coastal flood protection structures to allow an area that was once defended to become flooded) often involves flooding of land that was at some point in the past claimed from the sea. Returning some of this land to the sea often makes economic sense as in certain areas, even with defences, unmanaged flooding events are increasing as land levels gradually fall in the south and east of the UK - a natural process that is exacerbated by climate change which threatens more frequent stormier weather.

The coast, mudflats and saltmarsh that are created by realignment can absorb wave energy during storms, increasing the resilience of secondary lines of defence, while in estuaries the volume of water stored on the land can significantly reduce peak tide heights. Realignment also provides valuable habitat for wildlife (including commercially important fish species), traps nitrogen and phosphorus, sequesters carbon and provides recreational areas for the public. Such areas can also remain productive, for example by providing space to graze livestock breeds suited to salt marsh.

Whilst realignment does affect productive land availability, meeting the UK Biodiversity Action Plan target for no net loss of species and habitats would mean just 0.001% of total agricultural land in England being lost each year. This is 50 times less than the amount of agricultural land lost to development²⁵.

v) The EU should lead the way in developing and implementing sustainable responses to climate change in agriculture

Climate change has already started to alter ecosystems and agricultural conditions and will increasingly do so over the coming decades. This will be manifested through changes in, for example, rainfall amounts and patterns, temperature and the timing of seasons, all of which will affect agricultural capacity and yield. More frequent extreme weather events such as drought or flooding and the potential increase in invasive and damaging non-native species and diseases will also affect agricultural production. Water shortages are likely to be one of the most important factors for agriculture across the globe.

A healthy natural environment will help agriculture to be more resilient to climate change by providing services such as water management, nutrient recycling and pollination. It is therefore important that in adapting to climate change, agricultural businesses ensure that their actions do not further damage the environment.

vi) The CAP should be reformed to create a European Sustainable Land Management Policy that supports the delivery of environmental public goods across Europe.

²² Neve, P, Mortimer A M, Putwain P D 1996. Management options for the establishment of communities of rare arable weeds on set-aside land. *Aspects of Applied Biology* 44: 257-262.

²³ Moreby, S J 2007. Invertebrate distributions between permanent field boundary habitats and temporary stubble set aside. *Delivering Arable Biodiversity*. *Aspects of Applied Biology* 81: 207-212

²⁴ Natural England Evidence Team (2007) The Environmental Benefits of Set-aside; Review of Evidence

²⁵ Figures derived from National Office of Statistics for land use change and UKBAP no net loss target of 100ha per year.

As the CAP reform debate gathers pace, some stakeholders and decision makers are seeking to continue agricultural payments to farmers (that are not tied to increasing environmental benefits) on food security grounds. It has been argued that without direct aid, farmers would be subject to unmanageable market volatility, food prices would increase and the UK's ability to produce food would be damaged²⁶. A 2010 report from the European Parliament's Agriculture Committee²⁷ has also argued that direct payments are key to ensuring the long-term social and economic sustainability of EU farming, which in turn underpins food production and food security.

Link does not believe direct payments are justified on food security grounds alone. The EU has sufficient food to comfortably meet demand and this is not expected to change in the short to medium terms. Furthermore, the extent of the influence of direct payments on increased food production is unclear and some studies have shown that if they were to be phased out entirely, EU food production could increase²⁸. Those farming systems that produce high quality food alongside important environmental public goods, but risk going out of business if direct payments were to cease, need to be supported in other ways.

Whilst there may be a need for additional food production in coming decades, this will primarily be in developing countries and it is their agricultural potential that must be developed in a sustainable way, in parallel with poverty alleviation. The EU must support this process but acknowledge that the EU does not have the resources to 'feed the world'.

A key role for the CAP is to help secure long-term EU food security through protecting the natural resources upon which food production depends – our soils, water and biodiversity. If farmers are not encouraged to adopt ecologically sensitive approaches there is a risk that EU food security will become a genuine problem in coming years. Helping farmers to move away from fossil fuel-dependent systems of farming would also contribute to reduced GHG emissions and would help reduce the impact of increasing oil prices. In Link's *Beyond the Pillars* document, we proposed that the CAP should be reformed into a new policy, a European Sustainable Land Management Policy, that would combine the funding currently available in both 'pillars' of the CAP to create a new suite of rural development measures that would support the environmental public goods provided by farmers alongside producing more high quality food²⁹.

vii) Steps should be taken by the EU and the Government to prevent biofuel production damaging the environment and contributing to increases in the price of food

Climate change is a reality and bioenergy has the potential to make a real contribution to reducing global warming. However, to realise this contribution bioenergy must be produced and used in a sustainable way, resulting in significant greenhouse gas savings and avoiding damaging biodiversity and the wider environment.

²⁶ Farmers Weekly, 11 June (2010) *CAP reform must include direct support says NFU*.

²⁷ Committee on Agriculture and Rural Development (21/06/2010) REPORT on the future of the Common Agricultural Policy after 2013 (2009/2236(INI)) A7-0204/2010

²⁸ ECNC, LEI and ZALF (2009) Final report for the 'Update of Analysis of Prospects in the Scenar 2020 Study' *Preparing for Change*. Contract No. 30-CE-0200286/00-21

²⁹ Wildlife and Countryside Link (2008) *Beyond the Pillars: Wildlife and Countryside Link's policy perspective on the future of the CAP*. http://www.wcl.org.uk/docs/Link_Beyond_the_Pillars_11Mar08.pdf

In 2008, EU Member States agreed to a 10% target of energy in transport to come from renewable sources by 2020. Although the use of biofuel is just one non-fossil fuel based approach, it is proving the most popular with Member States. However, evidence continues to grow that biofuel support policies around the world are creating massive additional pressures for land use change, directly and indirectly, and have contributed to price rises of food crops³⁰.

Recent modelling by the European Commission indicates that meeting just over half of the 10% target from biofuels could lead, indirectly, to the conversion of up to 1000 million ha of land globally³¹. A significant amount of the bioenergy consumed in the UK and EU will therefore need to be imported, spreading the 'land footprint' of our bioenergy demand across the EU and into countries such as Brazil, Malaysia and Indonesia, which are growing increasing amounts of biofuel crops, such as sugar cane and oil palm.

The rising demand for biofuel crops means they are often directly competing for land with crops grown for food. This in turn contributes to higher food prices and can affect crop types and the availability of food in developing countries. A 2009 report into the land implications of producing biofuels, involving more than 75 scientists from around the world, cast doubt on the idea of using land that cannot be used for growing food to grow biofuels. It noted that there is no evidence that non-food crops can be grown efficiently for energy production on land that could not also grow crops for food³².

A recent report by ActionAid³³ suggests that if all global biofuel targets were met, food prices could rise by up to an additional 76% by 2020, leading to an estimated 600 million more people going hungry. The Organisation for Economic Cooperation and Development (OECD), FAO and United Nations Energy have all warned that government support for biofuels could have serious negative effects on food prices, with the world's poorest people likely to suffer most as a result³⁴. Such an impact would be in addition to the negative environmental consequences of renewable targets such as large-scale changes in land use, often into areas of important natural habitat.

viii) Introducing measures to reduce food waste should be made a priority

Food security is about much more than the amounts of food grown. In developed countries, 'post-plate' wastage occurs on a massive scale: every year, households in the UK waste 9.3 million tonnes of food and drink, almost a quarter of the total food bought³⁵. The vast majority of this waste could have been avoided through better planning, purchasing, storage or preparation. One important way to address food security would therefore be to address wastage.

For some food groups, notably fruit, vegetables and root crops, a significant proportion of the waste occurs before food reaches the consumer, mostly due to post-harvest crop grading driven by retailers' quality standards³⁶. This should be an area for action by government and retailers. Post-harvest waste is also an issue, and can lead to high levels of produce failing to reach the consumer, even in less

³⁰ IFPRI (2010) Global Trade and Environmental Impact Study of the EU Biofuels Mandate

³¹ Ibid

³² Howarth, RW & Bringezu (ed) (2009) Biofuels: Environmental Consequences and Interactions with Changing Land Use. *Proceedings of the Scientific Committee on Problems of the Environment (SCOPE) International Biofuels Project Rapid Assessment*

³³ Acton Aid (2010) *Meals per gallon: The impact of industrial bio fuels on people and global hunger*. http://www.actionaid.org.uk/doc_lib/meals_per_gallon_final.pdf

³⁴ UN (2007); Dornbosch and Steenblik, OECD (2007); OECD/FAO (2007); Kojima et al (2007).

³⁵ WRAP (2009) Household Food and Drink Waste in the UK

³⁶ [Resource Maps: fruit and vegetable](#). WRAP 2011.

developed countries. In Southeast Asia for example, post-harvest rice losses are estimated to range between 10-37% of the total harvested through handling, drying, transport etc³⁷. Rodents in Sub-Saharan Africa consume or contaminate up to 20% of a stored harvest³⁸. Addressing post-harvest waste in less developed countries would also go a very long way to improving food availability.

ix) Steps should be taken to encourage more sustainable diets to address the environmental issues arising from food consumption.

Reducing overall levels of meat and dairy consumption could have a positive influence on the sustainability of global food production. Meat and dairy consumption in the UK continues to be high by global standards and developing countries consume more meat and dairy products as prosperity rises. Around 30% of the Earth's land mass is now dedicated to feeding livestock³⁹. Although a significant proportion of this is represented by extensive grazing of natural habitats, animal feed is consuming a major share of the world's arable land and opening up new grazing land is a major factor in tropical deforestation. Livestock's climate change footprint is also significant, and the sector is estimated to account for 18% of global GHG emissions⁴⁰.

Encouraging people to consume healthy levels of more sustainable meat and dairy products will help reduce the environmental impact of food production.

x) The benefits of extensive grazing systems should be given greater recognition and support by policy makers and the food industry

It is vitally important that extensive grazing systems are supported as these are extremely valuable for habitat management and landscape quality and also produce food on land that often cannot be used for other food production purposes.

There is emerging evidence that grazing animals produce meat of higher nutritional value and improved health qualities than animals raised on concentrated animal feed^{41,42} and that milk quality is higher from animals grazing on semi-natural biodiversity rich grasslands rather than on intensively managed grassland. While such products tend to be more expensive, eating fewer (but higher quality) meat and dairy products is a strategy that could deliver a win-win for both health and sustainability.

**Wildlife and Countryside Link
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³⁷ De Lucia, M. and Assennato, D., 1994. Agricultural engineering in development Post-harvest operations and management of foodgrains. *FAO Agricultural Services Bulletin No. 93* Food and Agriculture Organization of the United Nations, Rome

³⁸ FAO, 1994. African experience in the improvement of post-harvest techniques. Synthesis Based on the Workshop held in Accra, Ghana, 4-8 July 1994 Agricultural Support Systems Div. Food and Agriculture Organization of the United Nations, Rome Italy.

³⁹ FAO (2006) Livestock's long shadow. FAO, Rome

⁴⁰ Ibid.

⁴¹ Scollan, ND, Hallett, KG, Wood, JD & Richardson, RI. (2007) The fatty acid composition of muscle fat in Charolais steers: influence of grass versus concentrate feeding, *Proceedings of the British Society of Animal Science*,

⁴² Wood J.D., Richardson R.I., Nute G., Fisher A.V., Campo M.M., Kasapidou E., Sheard P.R. & Enser M. (2004). Effects of fatty acids on meat quality: a review. *Meat Science* 66: 21-32.