

2. Scope and Approach

2.1 Background

This report relates to the commitment made by the Scottish Executive, in the document *A Forward Strategy for Scottish Agriculture*, “to examine the environmental issues which will impact on farming and food processing businesses over the next 5-10 years, and to advise on how best to tackle them”. A related working group, the Agriculture and Environment Working Group (AEWG), has been set up, and first met on 26/09/01.

The AEWG has identified the need for a review of recent UK and European (especially EU-based) research relevant to agriculture and the environment. The Macaulay Institute has been contracted to undertake this Review together with an input from the NERC Centre for Ecology and Hydrology.

2.2. Focus

This Review is primarily concerned with recent and current research findings that have the potential to contribute directly to practical cost-effective solutions in agricultural management, particularly those that reduce or remove the negative environmental impacts of agriculture on the natural heritage and that protect soil and water (rivers, lochs and bathing waters) from pollution. Potential for positive enhancements is also considered.

2.3. Scope

There is a significant amount of current research, in the UK and internationally, that focuses on the interfaces between agriculture and the environment. This represents a very wide field to review within the time-scale and budget available to this project. Whilst much of the related strategic research is written in English, appears in refereed journals and is comparatively easy to access, much of the applied research is reported in the “grey literature”. This is much more difficult to access. Therefore, whilst every effort has been made to provide consistent and comprehensive commentaries on recent research, the authors acknowledge that the Review cannot be taken as exhaustive. We accept that we will have missed some of the related research, particularly where it has been reported in languages other than English.

2.4. Approach

A feature of the interactions between agriculture and environment is that many of the related issues cut across conventional scientific disciplines and subject areas. Only through attempting to understand the functioning of whole agro-ecosystems is it possible to put these issues and their proposed solutions into an appropriate context.

Understanding and evaluating the costs and benefits of such interconnected issues required us to adopt a **multidisciplinary approach** to this Review.

This approach, although focused on individual environmental issues associated with agriculture (eg soil physical damage, accelerated loss of nutrients) allows us to flag-up their implications (linkages) to other issues.

2.5. Review Methodology

A list of specific issues was drawn-up in consultation with the Chairman and Secretary of the AEWG as follows:

- cost-effectiveness
- soil physical damage
- hydrological effects
- accelerated loss of nutrients
- herbicides and pesticides
- faecal pathogens
- habitats and biodiversity
- non-indigenous species
- landscape level effects
- climate change
- delivery mechanisms

Each of the Review team members was given the responsibility for reviewing one or two of these issues. Each was asked to follow a specific procedure and to conform as far as possible to a standard reporting format. The procedure was as follows:

1. Identify key words and main researchers in the topic area.
2. Conduct a search using the Web of Science and produce a harmonised bibliography of published research on the topic. Where possible produce lists of ongoing work from research registers, and lists of relevant UK demonstration projects.
3. Produce a critical commentary on the practical implications of these research findings, and condense this in the form of easily read summaries.

Each member of the Review team had two working days to complete their input. The relevant database searches were conducted separately by the project's research assistant.

2.6. Report Structure

This report (Part 1) presents the summary statements, the critical commentaries and selected references for each of the environmental issues, a set of associated fact sheets on each issue is appended. Part 2 of the report provides full selected bibliographies.