

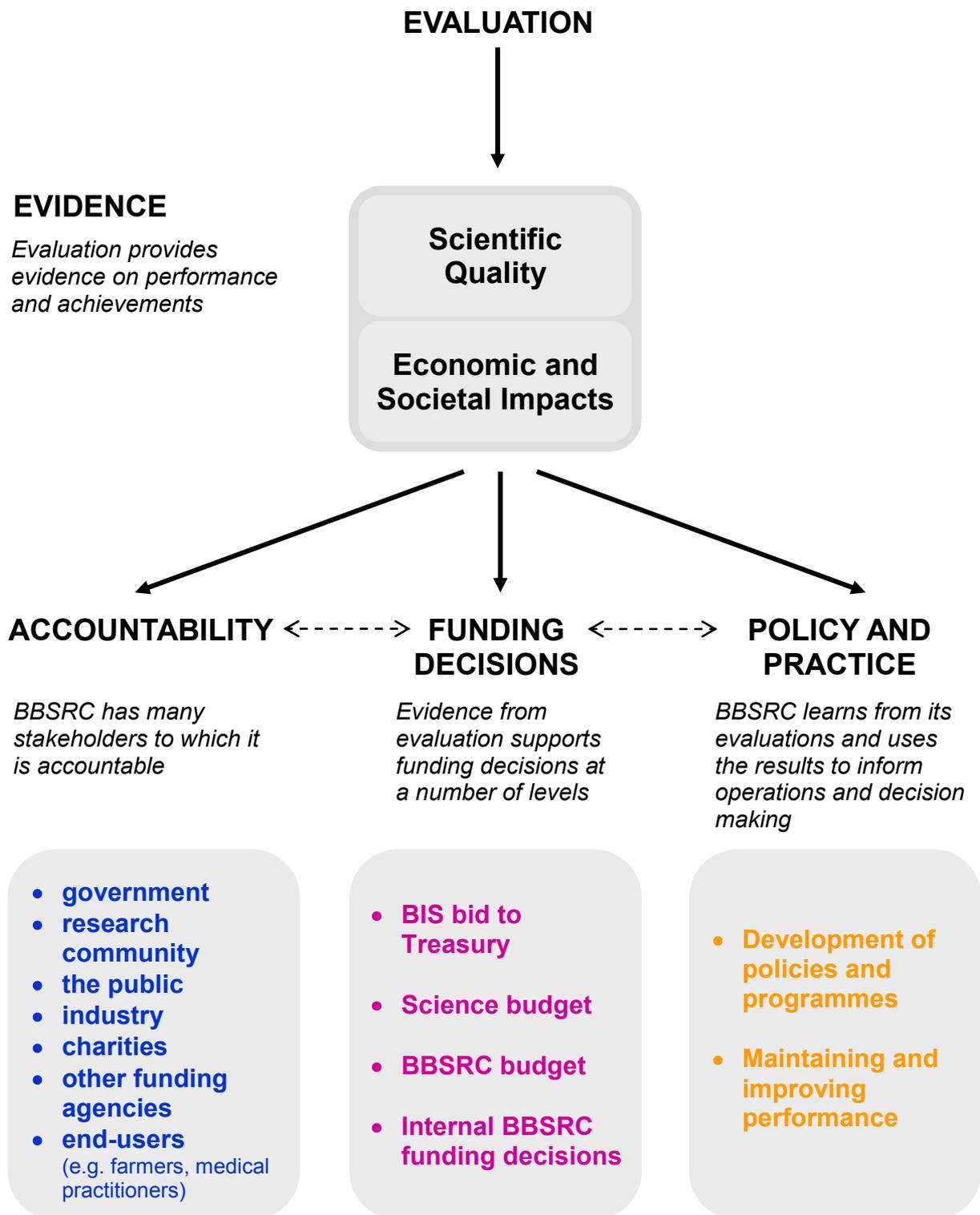


# Evaluation Framework: Research Programmes and Schemes

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# Why BBSRC Evaluates the Research and Training it Supports



## Overview of BBSRC's Evaluation Framework

- BBSRC is committed to the effective evaluation of the research and training it funds, as part of its strategy for evidence-based decision making.
- Evaluation helps BBSRC to account for the funds that it allocates, informs specific decisions on future research funding, and helps to improve BBSRC's policy and practice.
- Evaluation is an important tool for examining the relevance, performance, efficiency and impact of BBSRC's programmes and schemes in relation to their stated objectives and BBSRC's wider strategic aims.
- Evaluation provides the evidence required to assess the overall quality of research within the BBSRC portfolio. It provides assurance that BBSRC is funding the highest quality research and that the international standing of the UK in the biosciences is being maintained.
- BBSRC also uses evaluation to demonstrate the wider impacts of its research funding. This includes identifying the broader economic and societal impacts of the research we fund, as well as examining the interactions of BBSRC-supported researchers with other stakeholders such as industry and the public.
- BBSRC has an ongoing evaluation programme and conducts regular evaluations of its research investments and the funding schemes which guide them.
- When prioritising evaluations, BBSRC focuses on its major investments. The need to provide evidence of performance in strategically important areas is a significant consideration.
- BBSRC evaluations are evidence based. Data on the outputs and outcomes of individual projects are collected from grant holders. These provide the basis for metrics that help demonstrate the quality and impact of the BBSRC research portfolio as a whole.
- Evidence gathered during evaluations is assessed by a Panel of independent academic, industrial and other experts. The Panel produces a report of their findings and recommendations.
- BBSRC evaluations are designed to ensure that lessons learned are fed back into policy-making, programme design and operation. Results from evaluations are reported to the appropriate BBSRC Strategy Panels, who consider the conclusions and whether and how they might best be addressed.
- BBSRC ensures that the results of its evaluations are widely disseminated. Evaluation reports are made publicly available on the BBSRC website.

## Introduction

BBSRC funds over £400 million of research and associated training every year. As this is public money, BBSRC must account to government and other stakeholders for the funds it allocates and explain the achievements of the research it supports. Formal evaluation is an important means of meeting this requirement. Furthermore, evaluation has a vital role in informing funding decisions, BBSRC's policy, and its mechanisms and processes.

This document sets out BBSRC's approach to evaluation, addresses the questions of why such evaluation is important, and describes how BBSRC conducts evaluations of its research programmes and schemes.

## General Principles of Evaluation

Evaluation is an essential part of the evidence, experience and expert judgement used to make policy decisions and to manage programmes.

Evaluation is a systematic and, as far as possible, objective process examining a programme or policy's relevance, performance, efficiency and impact (both expected and unexpected) in relation to stated objectives.

To be fully effective, evaluations must be designed to ensure that lessons learned are fed back into policy-making, programme design and operation.

Successful evaluations involve collaboration between those carrying out the evaluation, the community whose work is being evaluated (the recipients of the research funding), and the bodies that will consider and implement the recommendations.

Furthermore, conducting an evaluation is not just a means to an end: the process itself generates lessons for individuals, for teams, and for the organisation as a whole.

Evaluation is distinct from appraisal of ideas at the outset, which is used to decide which policies and projects are taken forward<sup>1</sup>. It is also distinct from monitoring and audit. Whereas monitoring is continuous and focused on day-to-day activities, and audit concentrates on accounting for resources, evaluation takes a step back from day-to-day running of a programme, scheme or organisation, to look at the programme or scheme as a whole, in terms of its objectives, its achievements, and lessons learned.

The UK government provides guidelines on best practice for conducting evaluations of policies, programmes and projects in the HM Treasury Green Book: Appraisal and Evaluation in Central Government<sup>2</sup>.

BBSRC's evaluation framework is informed by these guidelines, and by the Department for Business, Innovation and Skills evaluation strategy<sup>3</sup>.

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<sup>1</sup> The role of appraisal in BBSRC is not discussed in this document. However, BBSRC makes extensive use of appraisal - for example, the peer review assessment of research proposals.

<sup>2</sup> [www.hm-treasury.gov.uk/data\\_greenbook\\_index.htm](http://www.hm-treasury.gov.uk/data_greenbook_index.htm)

<sup>3</sup> [www.bis.gov.uk/policies/economics-statistics/economics/evaluation](http://www.bis.gov.uk/policies/economics-statistics/economics/evaluation)

# Why BBSRC Evaluates the Research and Training it Supports

Evaluation is valuable because it helps BBSRC to account for the research and training funds that it allocates, it informs decisions on future research funding, and it helps to improve BBSRC's research policy and practice. Evaluation provides evidence of the economic and societal impacts of funded research, and provides assurance on the overall quality of research within the BBSRC portfolio.

**Accountability:** As a publicly funded body, BBSRC needs to account to government and to the public. BBSRC also needs to be accountable to the research community it supports, and to other relevant stakeholders including industry, other funding agencies, charities, and other end-users of research. Evaluation provides evidence of achievements and progress in BBSRC-funded research, enabling the Council to demonstrate its effectiveness.

**Funding decisions:** Evaluation contributes to future funding decisions at a number of levels, both externally and internally:

- **Justifying funding:** the Department for Business, Innovation and Skills (BIS) requires Research Councils to bid for future budgets. As part of the negotiations, Councils must submit evidence of the impact of the funds that they previously allocated. Evaluation provides both quantitative and qualitative evidence of achievements and impacts from funded research and training. There is increasing emphasis from BIS and the Treasury for Research Councils to demonstrate the economic and societal impacts of their research funding, and evaluation contributes to meeting this goal.
- **Internal funding decisions:** evaluation enables identification of achievements, progress against research objectives, and reasons for unsatisfactory progress. This facilitates the development of a

strategic overview, setting the framework for future funding decisions.

The findings from past evaluations played an important role in providing evidence of the impact of BBSRC-funded research in the 2004, 2007 and 2010 Spending Reviews, and contributed to the good allocation BBSRC received from the Science Budget.

A mid-term evaluation of the Genomics in Animal Function (GAIN) initiative showed that the initiative had achieved its goal of strengthening the research community. As a result it was decided that further phases were not needed.

Phases 3 and 4 of the BBSRC Biology of the Spongiform Encephalopathies Programme (BSEP) were reviewed in 2007. The Review Panel recommended that there was now little added value in funding research into transmissible spongiform encephalopathies through directed programmes rather than through regular responsive mode funding.

An interim evaluation of the Bioprocessing Research Industry Club (BRIC) in 2009 concluded that the scheme was an effective mechanism for supporting high-quality, industrially-relevant research in a strategically important area. The evaluation contributed to BBSRC's decision to support a second phase of the scheme (BRIC2).

**BBSRC policy and practice:** The evidence and strategic insight discussed above is also valuable for BBSRC's policy and practice:

- **Development of research policies and specific research programmes:** the results of evaluation inform policy decisions and the design of new schemes, programmes and processes.
- **Maintaining and improving performance:** evaluation enables managers to (i) share with others the lessons they have learnt and the good practice that they have developed; and (ii) identify weaknesses and improve processes, which is especially helpful for ongoing schemes such as responsive mode.

**Indirect benefits:** The questioning nature of evaluation and the process of gathering feedback from the scientific community can yield other benefits. Examples of this include improving the research community's perception of the Research Council ('we value your views'), and motivating BBSRC programme staff. In addition, evaluation can help foster changes in behaviour among groups involved in the evaluation process. For example, an increased emphasis on identifying the broader impacts of research may help embed a culture within the scientific community that recognises the importance of deriving economic and societal impact from excellent research.

An evaluation of the Japan Partnering Award scheme concluded that the scheme had successfully met its original objectives, but the goals of fostering partnerships through networking activities and enabling UK scientists to access Japanese facilities were no longer as relevant as they were at its inception. The scheme was subsequently realigned to promote collaborative research in the area of systems biology, ensuring that high quality research in priority areas for the UK and Japan is supported.

The rolling evaluation programme of BBSRC Research Committee responsive mode portfolios identified a number of issues that were subsequently addressed by BBSRC. For example:

- The Longer and Larger grants (LoLa) programme was introduced in response to the declining number of research grants of over three years duration
- Committee Priority Areas were withdrawn as they were too numerous and poorly understood by the research community
- Further impetus was given to the development of systems to collect data on the longer-term impacts of research funding, by the repeated observation that final reports do not fully capture these outcomes.

## Reporting

The results and recommendations of each evaluation are collated into a report and submitted to BBSRC senior management and the appropriate BBSRC Strategy Panel(s) for consideration.

Two of the main reasons for conducting evaluations are to inform funding decisions and to improve performance. For this to happen, the findings of evaluations need to be fed back into decision-making and strategic planning. BBSRC's senior management and BBSRC Strategy Panels consider the conclusions from evaluation reports and whether and how they might best be addressed. Specifically:

- BBSRC uses findings from evaluations to inform bids for future funding at the level of both the Science Budget and the BBSRC allocation, and as part of the regular reporting of performance.
- BBSRC senior management and BBSRC's Strategy Panels use evaluation findings to inform strategic planning and funding decisions, for example:
  - the funding balance (responsive mode, schemes, etc.)
  - the design of new initiatives, and deciding which initiatives to fund
  - the design of new schemes (or reform of existing schemes)
  - the review of existing, and design of new, mechanisms and processes.

## Dissemination

BBSRC ensures that the results from its evaluations are widely disseminated. Evaluation reports are made publicly available through publication on the BBSRC website.

The reports of past evaluations can be accessed at:

[www.bbsrc.ac.uk/researchevaluation](http://www.bbsrc.ac.uk/researchevaluation)

## Future developments

BBSRC is committed to the evaluation of its research and training portfolio. We continue to strengthen and improve our evaluation methods, as we gain more experience of evaluation and as new methods are developed. We also continue to work with the other Research Councils (through RCUK's Performance Evaluation Network) to coordinate our approaches to evaluation and identify best practice.

# BBSRC's Mechanisms for Evaluation

## Evaluation Methodology

BBSRC's current evaluation methodology is described in Appendix 1. It is developed both from our previous experience and international best practice in research evaluation. The methodology is continually improved and updated in the light of experience, with the aim of strengthening our evaluation methods, incorporating the assessment of the economic and societal impacts of research into the evaluation process, and reducing the burden on the research community.

## Selecting areas for evaluation

When prioritising evaluations, BBSRC focuses on its major investments. An initiative or research area may be selected to provide evidence of performance on objectives within BBSRC's Strategic Plan, BBSRC's Delivery Plan, or government priorities. Other drivers include how the research will continue to be funded, providing assurance on performance across the whole portfolio, as well as avoiding excessive burden being placed on the research community by the evaluation programme. BBSRC works with RCUK to link the BBSRC evaluation programme to the wider evaluation of major cross-Council programmes (e.g. cross-Council funding of bioinformatics, genomics).

## Evaluation Timetable

BBSRC has a timetable for the evaluation of its research grants portfolio to ensure that its schemes and programmes are evaluated regularly. Specifically:

### Major research investments

*Two or three each year.*

BBSRC makes major research investments through its responsive mode funding and research initiatives (time-limited research funding in strategically important areas). Following the completion of a series of Research Committee responsive mode portfolio evaluations in 2009, responsive mode evaluations now focus on discreet scientific fields or priorities within the portfolio. BBSRC also evaluates selected research initiatives two to three years after the majority of grants have been completed. Where appropriate, BBSRC aims to evaluate similarly themed initiatives or responsive mode research together, identifying common lessons and recommendations.

### Other schemes

*As resources allow.*

BBSRC operates a number of other schemes with specific objectives that are not necessarily defined by the scientific field they support (e.g. knowledge exchange schemes, studentships and fellowships, New Investigator, international Partnering Award schemes). Schemes are selected for evaluation in consultation with colleagues from BBSRC's Research, Innovation and Skills Directorate.

# BBSRC's Evaluation Methodology

## Evaluation Methodology

BBSRC's research evaluation involves a number of key steps:

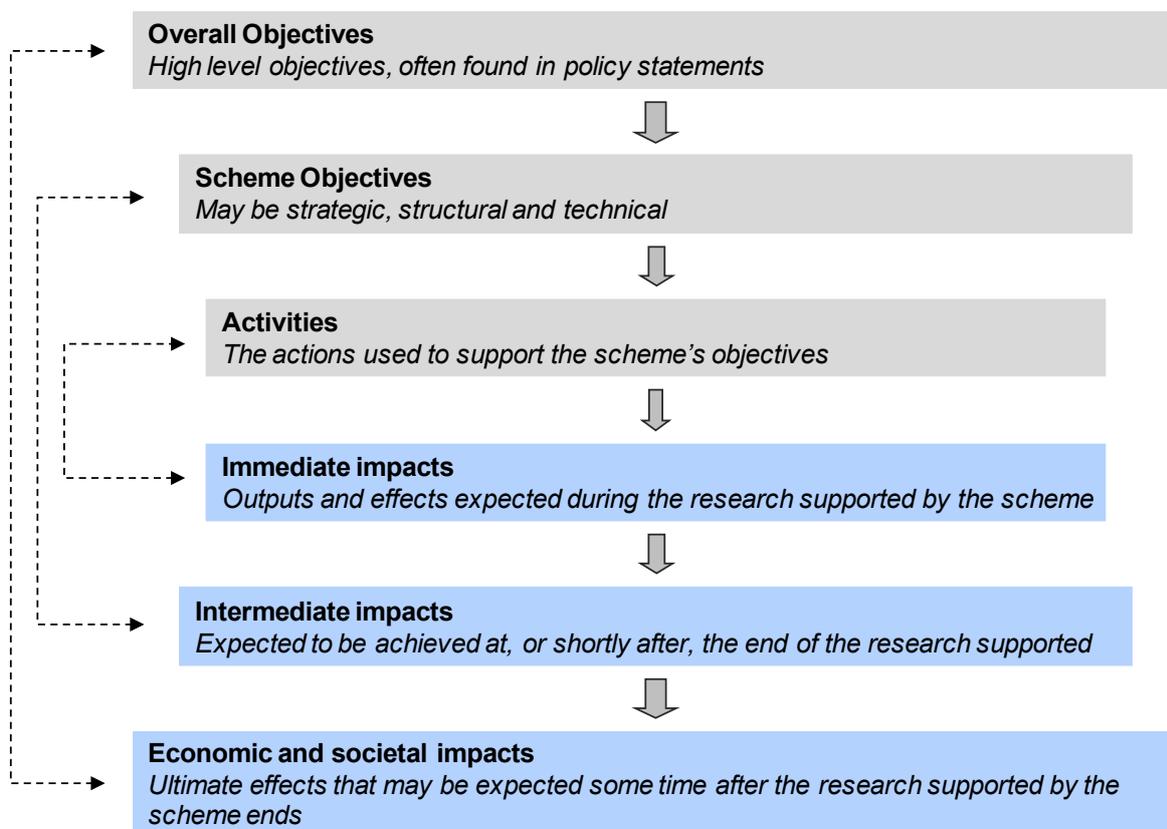
1. **Defining the purpose and objectives of the evaluation:** what is the evaluation for, who is the audience, how will they use the results?
2. **Defining the scope of the evaluation:** which programmes/research initiatives will it cover, which grants will be included, and over which period?
3. **Designing the methodology:** to include issues such as what evidence is needed to fulfil the evaluation's objectives, what methodologies will be used to gather this evidence?
4. **Conducting the evaluation:** whether the evaluation will take place in-house or be commissioned externally, how will the analysis be conducted, and the results reported, to ensure that they are relevant and useful to the target audience?
5. **Reporting the results and conclusions to relevant audiences:** submission of reports to BBSRC senior management and BBSRC Strategy Panels, dissemination of the results to the research community and wider public
6. **Ensuring that the conclusions are taken into account in decision making.**

## Defining the purpose and objectives

The purpose and objectives of the evaluation are decided at the outset and aim to address the reasons for evaluation: assessing performance, identifying achievements, justifying funding, accountability and informing BBSRC policy and practice. They define the evaluation's terms of reference, which will provide the guidelines for the evaluators and peer-reviewers throughout the course of the evaluation.

BBSRC uses logic charts to define the framework for evaluation of its research programmes and schemes. Logic charts are diagrams representing the objectives and desired impacts of a project or scheme. They put the scheme in its wider context, showing its links to the longer-term aims of the organisation within which it sits.

Logic charts comprise a number of levels:



The dotted arrows show how the levels link hierarchically, i.e. that immediate impacts result from the activities, that intermediate impacts should achieve the programme objectives, and that ultimate economic and societal impacts should demonstrate that the overall objectives have been achieved.

Evaluation focuses on the extent to which the 'impact' levels (shaded blue) of the logic chart have been achieved, in relation to the objective and activity levels. Detailed logic charts are prepared for each evaluation.

## Defining the scope

The scope of the evaluation depends on the size and type of programme or scheme to be reviewed, and on the nature of the evaluation's objectives.

The primary driver within BBSRC evaluations is to provide evidence of the scientific quality of the research within the portfolio, and its economic and societal impacts. Historically, economic impact has been derived from excellent science, and it is a fundamental assumption that poor quality research will have little positive impact.

## Designing the methodology

A variety of evaluation tools are available, each with advantages and disadvantages, and each suited to different evaluation questions. To ensure that the data collected are reliable, a combination of tools is used in order to triangulate the results.

The following table provides a brief description of the different methodologies available, annotated with comments relevant to the BBSRC context.

Method	Description	Comments
Peer review / Expert judgment	Opinions and recommendations are sought from experts specific to the field	Extensively used by BBSRC both for grant appraisal and for evaluation of responsive mode and Initiatives. Will remain at the heart of BBSRC's evaluation procedures
Survey	Asking multiple parties a series of questions, generating both quantitative and qualitative data	Questionnaire responses from grantholders are one of the primary sources of information in BBSRC evaluations.
Bibliometrics	Analysis of publications and citations data, using it as an indicator of science quality	Analyses of publication data have been an important part of previous evaluations, although BBSRC does not use more detailed bibliometric tools.
International benchmarking	Comparison of UK research with research quality in other countries, usually by peer review	BBSRC undertakes strategic assessment of its research in the international context, through inclusion of international members on evaluation Review Panels, and/or international referees.
Case study	In-depth analysis of a sample of a specific issue(s)	Increasingly used by BBSRC, particularly to inform evaluation of economic impact.
Economic analysis	Identifying the economic benefits and effects of research activities	With the current government emphasis on outcomes, could become useful in proving BBSRC's achievements against the high-level objectives identified in its 10-year vision, namely improved quality of life and economic prosperity in the UK. However, these methods are resource-intensive and therefore expensive.
Social analysis	Identifying and studying the contribution of research to quality of life	
Historical tracing	Tracing backward from a research outcome to identify precursor developments	
Meta-evaluation	Drawing together the results of single evaluations to identify high level and wide reaching issues or conclusions.	

When deciding the methodology to be used for a specific evaluation, BBSRC considers what it is possible to measure accurately, given the available time and resources. We aim to gather the most appropriate and reliable data or metrics that can be used to assess research quality and the wider economic and societal impacts of the funded research. These data also allow comparisons to be made against expectations or targets, and provide scope for international benchmarking.

For some of the expected outputs of research funding, it is relatively easy to measure performance (e.g. number of research articles published). However, for other areas providing reliable metrics is a challenging process. For example, the economic and societal impacts of research funding often have a significant

time-lag, and the most significant impacts can take decades to emerge. There are also difficulties with the attribution of impacts from research, and it can prove very difficult to relate major developments back to a single research grant or research group.

To address some of the difficulties in measuring economic and societal impacts, BBSRC measures progress towards achieving these outcomes. Milestones are identified that may reflect the steps needed to realise the greatest impact from our research funding (e.g. development of intellectual property, collaboration with industry, follow on funding from agencies supporting more strategic research). These serve as proxies and enable progress to be assessed.

Past evaluations have measured a wide range of outputs and outcomes:

#### **Research quality**

- final report grades
- research articles and other publications
- submissions to electronic databases
- new resources, tools, and technologies
- further funding
- academic collaborations
- international rankings (e.g. citation analysis)

#### **Economic and societal impacts**

- skills development and training
- support for early-career scientists
- new products, processes, resources, tools and technologies
- intellectual property
- start-up companies
- knowledge exchange with end-users
- industrial collaborations
- contributions to government policy (e.g. 3Rs)
- public engagement

## Conducting the evaluation

The evaluation team within the Corporate Policy and Strategy Group is responsible for the evaluation of BBSRC's research. Evaluations are conducted jointly by the evaluation team and the relevant programme team in the Research, Innovation and Skills Directorate. In addition, other teams in BBSRC may occasionally commission specific evaluations from external agencies.

Evidence gathered during the evaluation process is presented to a Panel of independent experts from academia and industry, which may include international representation. Panels assess the performance of the programme in relation to its objectives, but also address wider issues such as whether there were better ways to achieve the stated objectives or whether there were better uses for the resources.

## Reporting the results

A report including results and recommendations is produced for each evaluation, and made publicly available on BBSRC's website.

## Addressing the conclusions

Evaluation reports are submitted to BBSRC's senior management for consideration. Recommendations are taken forward by the most relevant Strategy Panel(s) and the extent to which the recommendations are addressed is monitored by the Corporate Policy and Strategy Group.

### Proposed evaluation programme timetable

#### 2012-13: to complete

- Industrial Partnership Award (IPA) and 'stand-alone' LINK schemes
- Industrial CASE studentships
- Sustainable Agriculture Research for International Development (SARID)
- Living with Environmental Change (LWEC)

#### 2012-13: to start

- Crop Science: BBSRC's response to the 2004 Crop Science Review
- BBSRC-attributable spin-out companies
- Structural and Chemical Biology
- Integrated Biorefining Research and Technology Club (IBTI)
- Bioenergy: BBSRC Sustainable Bioenergy Centre (BSBEC)
- Agriculture and Food Networks sector study
- Systems Biology
- Rural Economy and Land Use (RELU)

#### 2013-14: to start

- Follow-on Fund
- International Partnering Awards
- Bioprocessing Research Industry Club (BRIC)
- Crop Improvement Research Club (CIRC)
- Lifelong Health and Wellbeing (LLHW)

#### 2014-15: to start

- Advanced Training Partnerships
- Combating Infectious Diseases of Livestock for International Development (CIDLID)
- Insect Pollinators Initiative (IPI)
- BBSRC Strategic Reviews Programme
- Research and development on Campylobacter
- Global Food Security (GFS)

This timetable is reviewed annually by BBSRC's senior management.