



ROTHAMSTED
RESEARCH



Guiding principles for working with industry

Public dialogue on how Rothamsted Research
should engage with industry



Report to Rothamsted Research
April 2014



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Executive summary

This report summarises the findings from the Rothamsted Research public dialogue on how Rothamsted Research should engage with industry.

Rothamsted Research, the world's longest running agricultural research institute, aims to increase the amount of work it does with industry in order to increase opportunities for applied research and impact and diversify its funding profile. To this end, Rothamsted is developing a Knowledge Exchange and Commercialisation (KEC) strategy that will help it to achieve this aim. As outlined in its Communications and Public Engagement Strategy, Rothamsted Research is committed to engaging stakeholders and the wider public in its work and to emphasising its role as a listening establishment. To ensure that the development of the strategy is underpinned by a comprehensive understanding of public opinion, Rothamsted commissioned OPM Group to design and implement a public dialogue to gather considered public views on the kinds of guiding principles that should inform Rothamsted's approach to working with industry. Funding and support was also provided by Sciencewise¹ and the Biotechnology and Biological Sciences Research Council (BBSRC). This report presents the results of the dialogue and will contribute to Rothamsted's KEC strategy.

Process summary

The public dialogue began with deliberations by 49 members of the public in two workshops (held in the southern UK towns of Exeter and Harpenden). These locations were chosen as they are both areas where Rothamsted has research facilities. The workshops produced a preliminary set of principles that were considered and responded to by 24 experts and stakeholders at a stakeholder workshop in Harpenden. The dialogue ended with a final collaborative workshop which brought together participants from the Exeter and Harpenden events and some of the stakeholders from the stakeholder workshop. Together, participants considered the initial principles from each public workshop as well as the stakeholder reactions, and came up with co-produced sets of suggested principles.

¹ Sciencewise is the UK's national centre for public dialogue in policy making involving science and technology issues.

Headline findings

Defining the dialogue context

An important part of the dialogue was to enable participants to identify and define the context and purpose of the dialogue. Participants came to place great value on Rothamsted Research, especially its long history, impressive track record, expertise, and charitable status.

There was also much discussion about the meaning and nature of guiding principles, as many participants had not encountered the concept of guiding principles before the dialogue. As a result participants were interested in how the principles would be applied and how Rothamsted would weigh up the various factors in order to make decisions about working with a particular company. There was a general agreement that it was necessary for Rothamsted to follow guiding principles, but a variety of views on how rigid or flexible these should be.

Finally, participants identified that closer relationships with industry are important for Rothamsted to achieve impact and diversify its funding base. However, they were also concerned that closer industry links might impact negatively upon the way that Rothamsted conducts its research and the impact of the research it delivers, for example, through restrictions on intellectual property and transparency. Most of the discussions during the dialogue focussed on the tensions that typically arise in academic-industry collaborations, because this approach enabled participants to develop guiding principles that they felt would mitigate these tensions. Although the wide range of Rothamsted's industry partners was described to participants, their discussions suggested that participants predominantly saw industry as large manufacturing or chemical companies.

Participants' views on how Rothamsted Research should conduct its relationship with industry are presented under five main themes. These themes arose through a process of analysing and coding the outputs of the workshops to find the main areas of focus in participants' discussions:

1. Working for the public good
2. Open access to results
3. Transparency and public involvement
4. Independence and integrity
5. Reconciling idealism and pragmatism

Participants' discussions around these themes emerged through a combination of 'scene-setting', whereby case studies² were used to illustrate the potential tensions in a closer relationship between Rothamsted and industry, and the discussions that developed among participants as a result, including their interactions with stakeholders and experts.

Working for the public good

Working for "*the public good*" and ensuring the possibility for "*humanitarian usage*" of knowledge and technologies was strongly supported by participants, particularly in light of Rothamsted's charitable status and its receipt of public funding. There was, however, an acceptance that the concept of the public good is difficult to define. Most commonly, participants described it in terms of projects that make a contribution to human well-being, environmental sustainability or improved food production.

Participants identified potential industry constraints upon Rothamsted's ability to work for the public good that related to tensions surrounding the private ownership of intellectual property, and the use of products for profit making, rather than humanitarian, reasons. As such, they suggested that all research outputs developed with industry should be subject to a "*humanitarian usage clause*" whereby research is made available for use in situations where it could have an immediate benefit for people in need or in an environmental emergency, irrespective of any other contractual agreements with the company in question. Other suggestions included ensuring re-investment of profits back to Rothamsted and/or government; undertaking an assessment of a company's ethical track record before agreeing to work with them; and an assessment of potential scientific, ethical, socioeconomic and environmental implications of research projects before taking them forward.

Independence and integrity

Maintaining Rothamsted Research's independence and integrity was an important principle arising throughout the workshops. Participants saw credibility as one of Rothamsted's most valuable assets, which relied on Rothamsted being able to speak independently, based on rigorous and objective scientific research. However, there were concerns that working more closely with industry might inhibit Rothamsted's ability to work freely, or that its reputation as an independent research institute could be

² As outlined in the methodology and in Appendix 5, three case studies were used in all the workshops, to illustrate the kinds of tensions that may arise from Rothamsted working more closely with industry

jeopardised. Some argued that a dependence on industry for funding would, by definition, undermine the independence of Rothamsted, while others argued that it is possible to maintain academic independence separate from financing issues.

A variety of measures were proposed to protect Rothamsted's independence and integrity when working with industry. These included: establishing ethical partnering criteria, with some debate as to whether these should be applied universally, on a case-by-case or on a project-based basis; avoiding becoming over-reliant on a small number of large companies by maintaining a diverse industry funding portfolio; and assessing any risks to Rothamsted's independence and integrity before agreeing on industry collaboration projects.

Transparency and public involvement

There was significant agreement from participants that transparency and greater public involvement are very important in Rothamsted's work with industry. Regarding transparency, it was seen as important that Rothamsted communicate the aims, beneficiaries, and financing of all its work. Regarding public involvement, having engaged with stakeholders in the collaborative workshop, public participants identified some of the practical difficulties in involving the public on decision making, but insisted that a certain degree of involvement remained important, given that so much of the institute funding is public. Some participants highlighted this dialogue process as an example of suitable public engagement and the value of two-way interaction as opposed to one-way information provision.

A concern was the possibility that industry might restrict Rothamsted's ability to share information about what they are working on and that therefore Rothamsted's reputation could be undermined. Participants therefore proposed a range of measures that might help Rothamsted mitigate such problems. These suggestions included: specific methods to involve the public in order to inform decision-making; improved communication with the public and awareness-raising; being visibly open to external evaluation and scrutiny; declaring conflicts of interest; risk assessments that involve all Rothamsted staff; and improved interactions with the media.

Open access to results

Open access to results³ was deemed important by public participants, who felt that all research should eventually be in the public domain, although they did develop some reservations following stakeholder feedback regarding the practicalities of the timing of complete openness. Participants were concerned that closer links to industry would mean the development of intellectual property ownership agreements that would prevent Rothamsted from publishing work. The main concern was that this would prevent other research institutes, charities or farmers from accessing Rothamsted knowledge and putting it to use, as well as affecting the career development of individual scientists. However, participants also understood that exclusive access to results for a certain period of time could be an important condition of industry funding.

A variety of measures were discussed that could mitigate this tension. There was strong support for establishing an exclusivity period, where a private company retained rights for a specified time only, which was viewed as a pragmatic compromise between the requirements of Rothamsted and industry. There was some discussion about timescales for such an exclusivity period, with the general agreement that decisions in this respect should be project specific. Finally, participants felt that the encouragement of knowledge transfer should be a policy advanced by Rothamsted to increase access and use of the knowledge its research generates.

Reconciling idealism and pragmatism

Most of the principles developed by participants carried a moral or ethical weight, and focussed on the potential constraints industry might place on Rothamsted's ability to operate in an independent and ethical manner. However, participants were also keen to ensure that the principles they proposed would not jeopardise Rothamsted's ability to work effectively with industry. This difference in approach was described by one group at the collaborative workshop as principles that are "*idealistic*" and those that are "*pragmatic*" in nature. Although these priorities were not always viewed as conflicting factors, there was certainly a tension between the two issues, and most participants identified a need to find a suitable balance between them.

This tension led to three different standpoints. The first standpoint prioritised the more "*idealistic*" principles by ensuring they are safeguarded when working with industry. The

³ As a research council institute, Rothamsted is governed by the Code of Practice on Research (<http://www.rcuk.ac.uk/Publications/researchers/grc/>), which includes guidance about data ownership, publication, and conflicts of interest. This was, however, not discussed in the workshops.

second was a “*pragmatic*” standpoint that favoured a compromise approach whereby practical measures were suggested in order to achieve a balance between working within certain moral or ethical boundaries, and meeting the requirements of industry. Thirdly, some felt the two could be resolved by Rothamsted applying the principles at a strategic level rather than on a case-by-case basis. For example, participants suggested that Rothamsted could prioritise making profit and gaining skills on some projects in order to have the resources to prioritise working for the public good in other areas of Rothamsted’s research. In each of these standpoints, the topic of undertaking effective contract negotiation was common, and participants were keen to ensure that Rothamsted places a high value on the service it offers to industry.

Conclusion

The public dialogue process has provided Rothamsted Research with an understanding of the main issues of importance to public participants, in order to inform its work with industry. A diverse group comprising public participants and stakeholders was engaged in a dialogue on Rothamsted’s work with industry, with a view to developing a set of guiding principles and to support the development of a culture of listening and engaging in dialogue within Rothamsted. The results of the project will inform Rothamsted’s KEC strategy and can provide an exemplar to other research institutions.

Chapter 1 Introduction

Rothamsted Research is an agricultural research institute that has been in existence for 170 years. It produces high quality scientific research which shapes modern agricultural practice, and continues to provide scientific innovations and advice to the farming community. It is a respected authority, largely due to its long history, independent status and the fact that it is predominantly publicly funded.

The past couple of decades have witnessed a broader emphasis upon the role of academic institutions as catalysts of technological innovations and economic growth, as well as repositories of knowledge. In this context research institutions have been encouraged, through a range of 'soft' and 'hard' measures such as policy statements, mandates and requirements for research grants, to develop closer working relationships with industry. The idea is that closer collaboration with industry will lead to a more effective connection between knowledge, technological innovations and markets, and therefore increase the economic and social impact of research. In this vein, the 2012 Global Food Security Dialogue identified the relationship between research and action as an important theme: citizens argued that research designed with a practical application in mind should be given greater priority than it is currently.ⁱ As well as enhancing opportunities for applied research and impact, research-industry collaboration might lead to attractive new sources of funding for academic institutions, something that is increasingly important given the current financial climate.

In response to this changing context and in order to meet research challenges, Rothamsted Research wants to address the growing need for global food security and environmental sustainability by increasing its engagement with private companies. This is a significant change for the institute, but it hopes that by doing this, it can translate knowledge about food and agriculture into practical solutions that will benefit the environment, the economy and society. However, there are also tensions and drawbacks arising from universities and research institutions working more closely with industry partners – whether they are large international companies or smaller enterprises such as 'start-ups'. In particular these tensions relate to control of intellectual property (IP) and constraints on the traditional model of conducting and disseminating publicly funded research.

In order to inform decision making in ways that can mitigate these potential tensions, Rothamsted aims to develop a strategy for commercialisation and partnership with industry. Following commitments made in its recent public engagement strategy to build social, political and economic dimensions into research activity, it is important that the development of the strategy is underpinned by a comprehensive understanding of public opinion on the matter. Therefore, OPM Group was commissioned to design and deliver a public dialogue with the aim to produce a shared position between Rothamsted and the local public on the principles and values that will inform Rothamsted's engagement with industry. Many traditionally publicly funded research institutes have also developed innovation management strategies for their interactions with industry,ⁱⁱ but this project marks an original departure from established approaches by incorporating public dialogue into strategy development.

Funding and support was provided by Sciencewiseⁱⁱⁱ and Biotechnology and Biological Sciences Research Council (BBSRC).

The objectives of the dialogue were as follows:

1. To engage in discussion with a diverse group of the publics and stakeholders on Rothamsted Research's work with industry
 - a. To enable the development of public participants' understanding of Rothamsted Research's work and the issues arising when working with industry
 - b. To listen to the views of public participants on the issues arising of Rothamsted Research's work with industry
 - c. To inform stakeholders of Rothamsted Research's work with industry and listen to their views
 - d. To ensure that the public and stakeholders are adequately informed in order to provide input that will enable improving and validating the Knowledge Exchange and Commercialisation Strategy and Policy for Rothamsted Research
2. To develop a set of guiding principles, on the basis of the public and stakeholder engagement, for Rothamsted Research's work with industry
 - a. To understand, analyse and report the publics' views and suggested guiding principles to stakeholders and Rothamsted staff
 - b. To understand, analyse and report stakeholders' views and suggested guiding principles to the public and Rothamsted Staff
 - c. To reach a common set of guiding principles between the public and stakeholders (and/or understand where differences may arise) that will be used to inform Rothamsted Research's KEC strategy
3. Support the development of a culture of listening and engaging in dialogue within Rothamsted Research
 - a. To involve Rothamsted Research staff in the dialogue in a range of ways
 - b. To disseminate research outcomes to Rothamsted Research staff and, if applicable, other BBSRC-funded institutes
4. Outputs disseminated to other public-funded research institutions
 - a. To inform Rothamsted's KEC strategy and publicly report on the actions taken
 - b. To share the outcomes of the dialogue, and the lessons learnt, for example with the Leadership Forum of the Agri-Tech strategy, and communicate the work through to BBSRC, other research councils, BIS, Defra and the Government Office for Science, through established governance arrangements

It is important to note that dialogue processes do not occur in a vacuum, and the findings need to be understood within the context and process through which the data was collected. Like any dialogue, this project involved a specific set of people - both public participants, stakeholders and the delivery team - in a particular discussion at a particular time and place. Thus some further contextual factors need to be taken into

account. First, the context of government austerity measures and on-going debates regarding the privatisation, or marketisation, of public services, might be expected to have influenced participants' perspectives on Rothamsted working with industry. Second, it should be noted that Rothamsted is an institution which is valued in Exeter and Harpenden (both sites in which public dialogues took place), not least for the extensive employment they provide to the local area. The public dialogue might have been influenced by anxieties regarding the future sustainability of such a valued local institution. Finally, a few days prior to the first workshop, Rothamsted's decision to use genetic modification techniques to extract Omega 3 fish oils from plants had received some national media attention. Although at the recruitment stage most participants stated they knew little or nothing about Rothamsted, it is possible that some dialogue participants saw and were influenced by this news coverage in the meantime.

One further point of note is that the aim of this dialogue was not to establish public opinion on whether or not Rothamsted should increase the amount it works with industry: the decision to increase industry engagement had already been taken by Rothamsted. Rather, the aim of the dialogue was to establish public views on how Rothamsted should conduct its relationships with industry in the future. Because of this specific aim, participants were encouraged – through the tensions presented by Rothamsted and those illustrated in the case studies – to consider issues that might arise when working with industry, to enable them to suggest principles that might need to be in place to avoid such issues arising. This focus on issues and tensions was a feature of the process design and it should be noted that participants seemed overall broadly supportive of Rothamsted working with industry and its reasons for doing so.

This report documents the results from the dialogue process, which brought together 49 members of the public and 24 professional stakeholders and expert scientists to deliberate on the issues related to Rothamsted's work with industry. As described in the methodology chapter, the process was designed to build public understanding of the subject matter to a point where the public could deliberate on an equal footing with experts and stakeholders. The results presented here reflect the considered opinion of the participants involved in the dialogue process. The findings and public recommendations will inform Rothamsted's Knowledge Exchange and Commercialisation (KEC) Strategy, with further potential to also inform the approach taken by other research institutes to working with industry.

The report is organised as follows:

- Methodology: explains the approach used to engage the public and stakeholders in the dialogue, and to arrive at a set of guiding principles
- Defining the dialogue context: provides context for the following thematic chapter by explaining how participants developed their understanding of, and defined, the purpose and context of the dialogue
- Rothamsted's relationship with industry: presents five over-arching themes emerging from the dialogue and describes the development of the draft guiding principles within these

- Reflections on the dialogue process: discusses our reflections on the limitations and successes of the dialogue, and the learning points that arise from them
- Conclusions: summarises the overall conclusions from the dialogue, and the extent to which the objectives of the project were met

Finally, this report also includes a large appendix section that is itself rich in data and analysis, including the draft guiding principles that were produced as outputs from each of the workshops (see Appendices 1-3). It also complements the chapters within the report, and the relevance of different parts of the appendix will be made clear in the narrative.^{iv}

Chapter 2 Methodology

2.1 Rationale for our approach

Four main considerations informed the approach of the dialogue design.

First, citizens can bring socio-political perspectives to bear on technical matters that might be missed by experts, whilst experts hold technical knowledge that is fundamental to the development of practical policy measures.^v In recognition of these differences, the dialogue process included separate citizen and stakeholder/expert streams and was designed to build mutual understanding, to a point where citizens and experts could engage productively on an equal footing.

Second, findings from research into expert-citizen interactions in deliberative processes,^{vi} as well as our own experience and that of Sciencewise^{vii}, suggest that opportunities for informal discussions between citizens and experts provide an effective way of overcoming barriers between participants. Such opportunities were therefore built in throughout the dialogue.

Third, the dialogue topic is an abstract and technical one. Some aspects of the topic are difficult to discuss in detail without understanding how research partnerships work, and the issues and tensions that might arise from greater academic-industry collaboration in practice. Case study materials were used to build participants' familiarity with the topic. The near-to-real case studies illustrated some of the main tensions associated with increased engagement with industry. This enabled participants to exercise practical judgement by applying the abstract knowledge accrued through information provided earlier in the process to discrete cases. Research suggests that this transition from context-independent knowledge to context-dependent practical judgement characterises the development of subject understanding and competence. In the absence of opportunities for hands-on learning, case studies are an appropriate method to develop experience.^{viii}

Finally, a dialogue process shares much in common with qualitative research but differs in so far as those involved are not passive research subjects, but active participants in the process. The purpose of the dialogue was not simply to understand public opinion on the issue of interest, but to enable people with diverse backgrounds and perspectives to explore their interests and develop their preferences regarding the subject matter through deliberation. In keeping with the ethos of Sciencewise, the process was designed to take participants through a 'deliberative journey' that would allow the public and stakeholders to develop considered judgments as they were exposed to new information and engaged with other participants' perspectives through dialogue.^{ix}

These four considerations formed the back-bone of the dialogue process, which is described in more detail in the following section. Reflections on the method and recruitment are included later in this report (Chapter 5 – Reflections on the dialogue process).

2.2 Process

The diagram below sets out the stages and activities for this project, which are described in detail below.

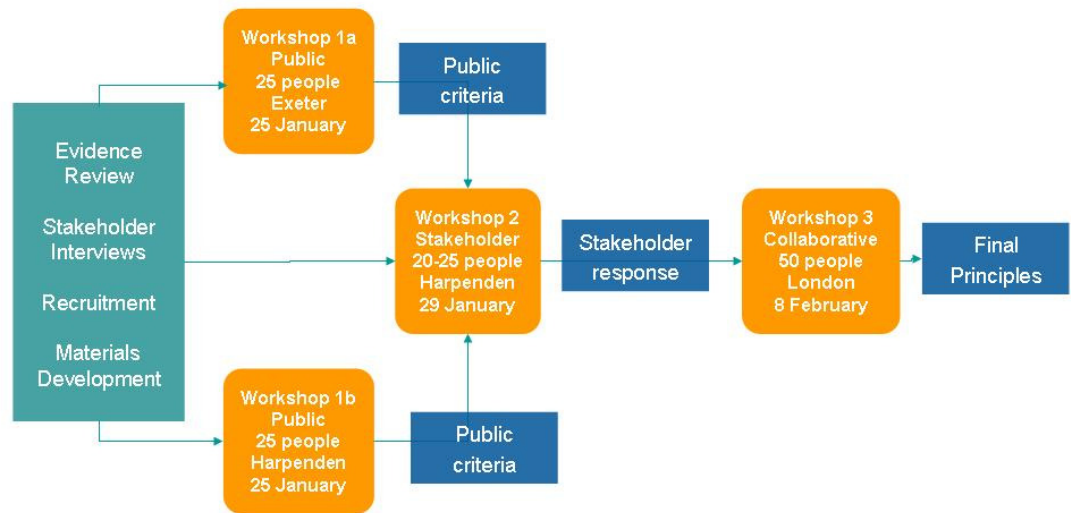


Figure 1: Dialogue process

2.2.1 Oversight of the process

An Oversight Group, comprising eleven members with a range of perspectives and expertise, was set up to oversee the dialogue process and material. The role of the group was to help ensure that the dialogue material was comprehensive, balanced and accessible to a lay audience and that the engagement process was far-reaching, accessible and targeted all relevant stakeholder groups. The Oversight Group acted in an advisory capacity to the dialogue management group.

The Oversight Group met three times throughout the course of the dialogue. At the first meeting, the group provided input on the overall approach to the dialogue, the planned scoping stage and the stakeholder and public recruitment approach. At the second meeting, the group provided input on draft workshop methodologies and case study materials. The final meeting centred on a presentation of findings from the dialogue after which, members provided input on the draft report.

The chair of the Oversight Group, although unable to attend the first two meetings, provided advice in the early stages of project tendering and award of contract.

Please see Appendix 7 for the formal Oversight Group membership.

2.2.2 Scoping stage

Having agreed and finalised an overall approach with the Rothamsted Research Oversight Group, a web-based review of information and eleven scoping interviews with experts and stakeholders were carried out. The purpose of the scoping stage was to

identify the main issues surrounding the brief and begin to develop the initial agenda for the dialogue process. The findings from these activities informed the process design for the subsequent workshops (see Appendix 5), the materials to be used during the workshops (see below), and the invitation list for the stakeholder workshop (see below).

The web-based review involved consulting relevant academic literature on developments in the political economy of academic research, covering issues such as Knowledge Exchange Communities,^x industry-university partnerships,^{xi} and the role of universities in economic development.^{xii} The aim of this review was to develop an awareness of the practical issues surrounding the dialogue topic, in order to design materials that covered all relevant themes and would frame the dialogue fairly.

Stakeholder interviewees were selected, following the web-based research and input from the Oversight Group, to ensure a range of perspectives to inform the development of the workshop process and materials. A total of eleven stakeholders and experts were interviewed, including representatives from civil organisations, academics and researchers, technology transfer officers and one intellectual property lawyer with extensive experience working with academic-industry intellectual property disputes. Interviews followed a semi-structured format and focussed on gathering information on practical examples that highlight the different potential problems and tensions arising from industry-research partnerships. These would underpin the development of a series of case study materials to be used to build participants' familiarity with the topic and stimulate discussion.

2.2.3 Workshop materials

Three main areas of tension which could potentially arise in industry-research collaborations were identified during the scoping stage and further refined following input from the Oversight Group. Case studies were developed to provide practical illustrations of these tensions to the public participants.

The cases were complemented by two short presentations from a Rothamsted representative, and an introductory scenario designed to build public participants' understanding of the notion of a 'guiding principle'. The scenario and case studies are described in detail in Appendix 5, but short descriptions are provided here for ease of reference.

(i) Introductory scenario

In order to build participant understanding of the practical use of guiding principles, we presented participants with a hypothetical scenario whereby their local GP is considering outsourcing some of its services to the private sector. Having been introduced to NHS guiding principles, participants were asked to discuss how these applied to the notion of commissioning services, as well as to making decisions as to which services to commission and from which providers.

(ii) Rothamsted presentations

Two presentations were delivered by a Rothamsted representative at each public workshop. The first presentation introduced public participants to Rothamsted Research and its work, how it works with industry and why, and the need for guiding principles. The second presentation summarised a real example of how Rothamsted currently works with industry. A condensed version of the presentations was given at the start of the stakeholder workshop.

(iii) Case study one – mosquito repellent

The first case study was intended to highlight issues surrounding the ownership of intellectual property in collaborative projects as well as the allocation of profits derived from these. The hypothetical scenario presented involved a pharmaceutical company approaching Rothamsted to develop an innovative mosquito repellent. The work diverges from Rothamsted's usual focus, but the company offers a substantial sum that will free up resources for other projects. However, the company insists on exclusive ownership of all products developed and offers Rothamsted just a 1% share in global profits.

(iv) Case study two – pesticides and salmon stocks

The second case study was developed to highlight conflicts between carrying out privately funded research and acting as an institute that can give independent advice, and, just as importantly, be perceived to be doing so. The situation presented involved a controversy regarding local suspicions that a pesticide developed by a pharmaceutical company that Rothamsted has partnered with, was polluting local rivers and harming salmon stocks. The government is considering a ban of the pesticide, but based on scientific evidence that salmon reduction is not attributable to the product, Rothamsted advises that they should not. Environmentalist organisations are heavily critical of Rothamsted's advice, and point to Rothamsted's conflicting interests between protecting funders and influencing government policy. Rothamsted runs the risk of suffering severe reputational damage.

(v) Case study three – improving the nutritional quality of food

The third case study was intended to highlight constraints placed upon Rothamsted's freedom to operate by partnering with industry. Rothamsted seeks to build upon the results of a project by partnering with industry to develop the commercial potential of findings that could improve food production. However, the original research used a computer based modelling system provided by a research institute that does not allow its systems to be used for commercial purposes. If Rothamsted cannot negotiate access, the research will be compromised.

2.3 Recruitment

Given the complex nature of the subject matter and the importance of establishing a solid foundation for future activities, an intensive set of activities with a relatively small group of people would produce more useful outputs than would be possible with a large group. Dialogue is not a statistical research method and does not aim to deliver outputs

that are representative of the general public. Instead it aims to explore the perspectives of a diverse and inclusive group of people who have had opportunities to develop a considered opinion on the issues. For this reason, the aim was to recruit 25 people for each public workshop.

2.3.1 Recruitment: Public workshops

Participants were recruited by a professional agency, to a quota sample specifying a broadly defined set of criteria such as age, gender and socioeconomic status. The aim was to recruit 25 members of the public to attend each public workshop. Actual attendees numbered 24 in Harpenden and 25 Exeter, all with varied backgrounds, experiences and perspectives.

All Exeter participants, and a proportion of the Harpenden participants, were recruited on-street in the local towns and villages. The remainder of the Harpenden participants were recruited through a database. A sub-sample of those database participants who responded to an initial scoping email was selected using the same screening questionnaire and quota applied to the on-street participants. Please see Appendix 6 for the recruitment specification and questionnaire.

The recruitment strategy for public participants ensured a mix of age, socio-economic status, ethnicity and gender at each workshop, and that at least two thirds of participants had never heard of Rothamsted Research before. This, and the other criteria in the recruitment specification, ensured that participants would bring a range of views into the room. The two tables below show the demographics of the participants at the first two public workshops. None of the participants had attended a public dialogue event in the past year.

Table 1: Public participants at the Harpenden public workshop, 25 January 2014

Recruitment method	Male/female	Age	SEG	Ethnicity	Other criteria
14 database	12 M	4 (18 – 25)	5 B	2 Black/Afro Caribbean	8 participants aware of Rothamsted Research
10 on-street	12 F	6 (26 – 40)	10 C1	2 British Asian	No participants worked in the farming, environmental campaigning or biotech industry
		9 (41 – 55)	3 D	20 White British/White other	
		5 (56 – 70)	1 E		Mix of 12 different postcodes, including 2 from LU1/LU2, 6 from AL5, 3 from AL1, and 6 from AL4

Table 2: Public participants at the Exeter public workshop, 25 January 2014

Recruitment method	Male/female	Age	SEG	Ethnicity	Other criteria
All on-street	13 M 12 F	7 (18 – 25) 4 (26 – 40) 7 (41 – 55) 4 (56 – 70)	6 B 6 C1 4 C2 5 D 4 E	1 Asian 24 White British/White other	2 participants aware of Rothamsted Research No participants worked in the farming, environmental campaigning or biotech industry Mix of 10 different postcodes

At the time of recruitment, participants were given a brief description of the project and details of who would have access to their views and were asked for their permission to transfer this data to Rothamsted Research following the project.

Participants were given a small financial 'thank-you' (£60 for the first workshop, £70 for the second workshop) to recognise the time and energy they had given to the process. This helps to recruit participants with no prior interest in the topic.

2.3.2 Recruitment: Stakeholder workshop

The Oversight Group provided an initial list of stakeholders whose views would be of value to the project, during the scoping stage or in the dialogue workshops. We used a chain-referral (or 'snowball') sampling strategy to expand the list during the scoping stage, asking interview participants to recommend colleagues, and so on. When using this kind of method it is important to start with a diverse sample to minimise the chances that important stakeholders are not missed. Therefore the initial list provided by the oversight group included stakeholders and experts from a wide variety of sectors, as well as stakeholders from groups representing different professional interests. These included academic researchers, business executives, end users such as farmers, and third sector organisations.

We invited 60 stakeholders to participate in the stakeholder and collaborative workshops, with the aim to recruit around 25 people. We achieved a final sample of 24, 16 of whom were external stakeholders from a range of sectors including businesses, academic organisations and public regulatory bodies, and eight of whom were staff members from Rothamsted Research.

2.3.3 Recruitment: Collaborative workshop

We asked participants in the two public workshops whether they were interested in attending the collaborative workshop in London. Out of 48 participants, 34 expressed an interest and all of these were invited. The final number of public participants involved in the collaborative workshop was 29 (18 from Harpenden, 11 from Exeter).

Table 3: Public participants attending the London collaborative workshop, 8 February 2014

Exeter / Harpenden	Recruitment method	Male/ female	Age	Ethnicity	SEG	Other criteria
18 Harpenden 11 Exeter	Self-selecting from workshop 1, resulting in: 10 database 19 on-street	16 M 13 F	7 (18 – 25) 7 (26 – 40) 10 (41 – 55) 5 (56 – 70)	2 Black/Afro Caribbean 2 Asian/Asian British 25 White British/White other	8 B 10 C1 4 C2 4 D 3 E	7 participants aware of Rothamsted Research No participants worked in the farming, environmental campaigning or biotech industry Mix of 14 different postcodes

All stakeholders involved in the workshop were invited to attend the collaborative workshop and eight were able to do so: three were external stakeholders and five were Rothamsted Research staff members.

2.4 Workshops methodology

The overall aim of the dialogue was for the public participants involved to develop a set of guiding principles to help inform how Rothamsted Research works with industry. As illustrated in the flowchart above, the dialogue had three workshop stages and in this section we explain the engagement process used for each of them. The summary agendas for each workshop are included in Appendix 5.

2.4.1 Public workshops

The aim of the initial public workshops was to introduce public participants to Rothamsted Research and its work and establish the main objectives of the project.

To do this, we held two workshops, one in Exeter and one in Harpenden, both using the same process design and materials. These locations were chosen because both have Rothamsted Research facilities nearby. Given the early stage of this dialogue and the nature of the topics to be discussed, participants were provided with the necessary background information in the form of 'building blocks', to enable them to engage actively with the subject matter in a gradual way.

To support this, Rothamsted Research staff presented background information about the history of the institute, its areas of research focus, funding sources, external relationships, and current financial situation. We then used hypothetical scenarios and case-studies that illustrated the notion of guiding principles as well as the kinds of tensions and opportunities that can arise when a research institute works with industry. The case studies were based upon the scoping research and provided an initial focus and catalyst for discussions, allowing public participants to see the main practical problems and advantages of different approaches and contractual arrangements. (These are provided in full detail in Appendix 5).

In discussions participants were prompted to come up with draft guiding principles that might help Rothamsted avoid the problems presented by the case studies, resulting in a list of principles and guidelines from each table. These were clustered and summarised rapidly by facilitators. Finally, participants were assigned a number of sticky dots, and asked to prioritise the principles by sticking dots next to those they agreed with most strongly. This resulted in a first set of guiding principles from each public workshop (see Appendix 1).

2.4.2 Stakeholder workshop

The aim of the stakeholder workshop was to introduce stakeholders to Rothamsted Research and its work, establish the main objectives of the project, and to elicit their feedback on the initial draft guiding principles from the public workshops.

To do this, we ran a half-day stakeholder workshop in Harpenden that was attended by external stakeholders and Rothamsted staff. The design of this workshop assumed a greater level of prior knowledge and therefore did not focus on building understanding as much as the public workshops in Exeter and Harpenden, but broadly followed a similar agenda. The session began with a brief introduction to Rothamsted Research and the aims and objectives of the dialogue. Stakeholders were introduced to the same case study materials that were used in the public workshops and were prompted to develop their own set of guiding principles that might alleviate the tensions (see Appendix 2).

Stakeholders were then presented with a consolidated set of principles taken from the two public workshops, and asked to provide constructive criticism and comment. The main objective of this session was for these comments to help inform the next iteration of the public's principles. The process was designed so that stakeholder input could

hone the public's thinking so that it is more in line with the actual experience of being a Rothamsted scientist working with industry. The stakeholder workshop ended with a session where the stakeholders developed a briefing response to the public's principles, including their reasons for agreeing or disagreeing with the principles and any omissions.

The final outputs from the stakeholder workshop were a list of draft guiding principles for Rothamsted from stakeholders, and a critical commentary on the public's draft principles. These would frame discussions between stakeholders and the public in the final collaborative workshop.

2.4.3 Collaborative workshop

The aim of the final, collaborative workshop was to build on the outputs from the first two workshops to develop a final set of guiding principles to inform Rothamsted's work with industry.

To do this we ran a workshop that brought together some members of the public who had attended the Harpenden and Exeter workshops, and some participants from the stakeholder workshop. Participants were presented with outputs from each of the public workshops, to gain an understanding of what happened at the parallel workshop they had not attended and explore any commonalities and differences. Next, the comments from stakeholders were considered and discussed, with stakeholders providing further explanation and illustration of their views in response to questions and challenges from public participants. The aim of this was to support the public participants to develop their views and use the stakeholder input to further refine their draft guiding principles.

The case studies were reintroduced as a way for participants to 'stress-test' their refined guiding principles through further discussion of these hypothetical scenarios, and to give public participants a practical way to understand and critique the stakeholder feedback.

The final draft guiding principles from each small group were clustered and summarised rapidly by facilitators. Finally, public participants were assigned a number of sticky dots, and asked to prioritise the principles by sticking dots next to those they agreed with most strongly. This resulted in a prioritised set of draft guiding principles from the public, to inform Rothamsted's work with industry (see Appendix 3). This list cannot be considered a consensus set of guidelines, but allowed for an indication of the level of agreement and strength of feeling from participants, to feed into the subsequent analysis of workshop data, the findings of which are outlined in the following chapter.

2.5 Analysis and reporting

2.5.1 Data collection

The report is based on a combination of data sources. Our table facilitators took extensive notes of the key points and arguments being made by participants across the public, stakeholder and collaborative workshops. These were transcribed into electronic format and uploaded onto a qualitative data analysis computer software package called

NVivo^{xiii}. Audio recordings of the small group discussions were also referred to in order to expand on and verify the facilitator notes. Table notes were complemented by the prioritised lists of principles which participants came up with at the end of each session, also uploaded onto NVivo.

2.5.2 Analysis

The analysis was carried out using a cross-sectional code and retrieve method, whereby researchers derive a common set of categories that is developed in conversation with the data, applied across the entire data set and then used as a means of searching for and retrieving categorised sets of data.^{xiv} NVivo Qualitative data analysis software offers a useful aid in the organisation of the unwieldy data sets that characterise qualitative research. It enables a more effective organisation of the dataset through the classification of different parts of the data set. These allow for the creation of 'sets' which enable the researcher to isolate different groups of respondents and explore and compare themes within these. Qualitative analysis software is also especially useful in the latter stages of analysis to explore issues which might not have been covered in initial coding rounds through the use of queries.

A coding framework was developed following standard qualitative research procedures: an iterative process involving the incremental application and refinement of codes, beginning with samples of the data set and progressively applying refined coding frameworks to larger samples until full coverage is achieved. The data was loaded onto the software, organised, classified and analysed through a series of coding cycles. Our analysts developed the coding framework in close collaboration, holding regular ad-hoc meetings to clarify code meanings and iron out inconsistencies in coding. The coding frame thus underwent substantial change, as coding schemes were re-designed and re-applied to best 'fit' the meanings in the data, until a framework was developed that captured all relevant units of meaning, and also provided the beginnings of a narrative structure for the report.

2.5.3 Reporting

In practice, much of the writing-up process occurs during analysis, as researchers develop analytic notes and explore relations between phenomena. Our researchers based the report structure on the coding framework previously developed and referred back to analytic notes, categories and themes captured in NVivo to write the report. Two drafts of the report were reviewed and commented on by members of the Management Group and Oversight Group.

Quotes from participants have been used throughout the report to illustrate particular viewpoints summarised in the narrative.

Chapter 3 Defining the dialogue context

3.1 Introduction

This chapter describes how the public identified and defined the context and purpose of the dialogue. Whilst Rothamsted and OPM Group had an important role in framing the subject and scope of the dialogue, it is important that the understandings and problem definitions developed by public participants also influence the process.^{xv} This is also a way in which participant ownership of the dialogue can be maximised.

Most of the discussions presented in this chapter took place at the first two public workshops, where the focus was primarily upon enabling the public to develop their knowledge of the context and purpose of the dialogue. Content from the stakeholder and collaborative workshops is also included, where appropriate, to illustrate where participants' views changed or developed over the course of the dialogue.

As described in the 'Methodology' chapter, participants came with a range of backgrounds and levels of prior knowledge of Rothamsted's work, and the process used 'building blocks' to inform their discussions. In the public workshops, participants listened to presentations, had opportunities to ask questions of Rothamsted staff, and were able to call upon them to provide clarifications and factual information to address any areas of confusion that arose during small group discussions.

This chapter, therefore, outlines the areas where participants engaged most actively with the contextual and background information provided during the early stage of the dialogue, to demonstrate how they framed their subsequent discussions and the development of their draft guiding principles. This information is arranged into three sections:

1. Rothamsted Research and their work
2. The concept of guiding principles
3. Rothamsted's work with industry

3.2 Rothamsted Research

Participants arrived at the first workshops with variable knowledge of Rothamsted Research and its work. At this early stage in the dialogue, as they were provided with background information, they began to place great value on the research institute, and were particularly impressed by its long history of 170 years, its extensive archive of research material, and its independent status. They felt that this placed Rothamsted in a position to adopt a robust negotiating strategy, positioning themselves as "*partner of choice*" for industry partners. The importance of robust contract negotiation and placing a high value on Rothamsted's services arose frequently throughout the dialogue as described in the 'Reconciling idealism and pragmatism' section of the next chapter.

Participants at both workshops also saw value in the global reach of Rothamsted's work, particularly in relation to achieving food security in an environmentally sustainable way, the challenges of which cross national borders. At the Exeter public workshop, participants were interested to find out more about how Rothamsted's work relates to specific fields of research they were concerned about, such as organic farming, plant genetics, and the long-term impact of pesticides and chemicals on wildlife and climate change. Participants at the Harpenden workshop were interested in soil capacity and land use, asking questions about the costs and benefits of increasing agricultural land use or working to increase crop yield.

Rothamsted's charitable status was felt by participants to have implications for the way it works and the type of projects on which it works. Many thought that, as a charity, and as an institute in receipt of public funding, Rothamsted should focus on advancing the public good, as discussed in more detail in the 'Working for the public good' section of the following chapter.

At the Harpenden workshop in particular, participants were interested to understand more about Rothamsted's funding situation. For example, they asked questions about the different sources of funding, including whether Rothamsted receives funding from other countries or from charities, and also about what the impact would be if Rothamsted was not able to secure industry funding, particularly if government funding was withdrawn or significantly reduced.

3.3 Guiding principles

Most participants had not encountered the concept of organisational guiding principles prior to the dialogue. There were some questions and some uncertainty about the purpose or rationale for developing guiding principles, and how they would be applied. At both public workshops, participants asked how Rothamsted would weigh up the various factors in order to make decisions about proceeding with a particular industry partnership. In Harpenden there were questions about whether moral or ethical criteria would be used, and participants in Exeter asked how the benefit to society and value of outputs would be factored in to the decisions.

As they grew familiar with the notion of guiding principles through discussion with stakeholders and each other, and by reviewing the scenarios and case studies provided, a broad theme emerged and continued throughout the dialogue. This concerned the flexibility of guiding principles, and the identification of a potential trade-off between pragmatism and idealism.

Some participants argued in favour of clearly defined principles that could be applied universally when deciding whether to partner with industry and which companies to partner with. Their argument was that this was the only way Rothamsted could ensure it participates only in "*ethically sound*" projects and partners that share its values. Others argued that this approach might be constraining, arguing for more flexibility in the application of principles so as not to deter companies.

Several participants felt that a balance should be struck between rigidity and flexibility, and between pragmatism and idealism. For example, Rothamsted might adopt baseline

criteria that apply to projects, rather than to companies. Some participants felt this would decrease constraints upon Rothamsted's ability to partner with industry and gain resources, whilst also ensuring an ethical basis for Rothamsted's work. This idea about finding a balance is discussed further in the 'Reconciling idealism and pragmatism' section of the next chapter.

3.4 Working with industry

At the public workshops, participants heard that the reasons Rothamsted works with industry include:

- To increase funding and reduce reliance on the public purse
- To access expertise and market knowledge
- To fund near-market developments (research that can be used commercially)
- To help deliver the results of its work to society
- To maximise its impact on the economy

Participants quickly picked up on the need to attract funding and many of the initial discussions were in this context. As the dialogue progressed they explored the other reasons for working with industry too, as described below. The ability to attain the resources necessary for both maintaining and expanding Rothamsted's research capacity was seen to be important and, in this respect, greater collaboration with industry was generally accepted and supported as a necessary development.

"It's inevitable. If you're going to do the research and you haven't got the money then you have to go for those that are going to pay" (Exeter public workshop discussion)

At both public workshops, although there was broad acceptance and support for Rothamsted's relationship with industry, there were also some reservations and concerns. These concerns were prompted by the illustrative case studies outlined in the 'Methodology' chapter, as well as the following tensions that were presented to participants at the beginning of the public workshops:

- Freedom and Openness
 - Data sharing between institutes may be restricted
 - Confidentiality may be required – even within the institute
 - Publication could be delayed or restricted
- Reputation and Perception
 - Rothamsted's reputation for independence may be compromised
 - Rothamsted's ability to contribute to policy may be restricted
- Ownership and Reward
 - Insisting on open access may reduce Rothamsted's commercial return
 - Placing conditions on industry to ensure maximum public benefit may reduce commercial viability

The detail of participants' concerns is explored in the following thematic chapter. The concerns relate broadly to: a risk to Rothamsted's ability to be independent; the perception of the institute as an independent voice, and its ability to make decisions with integrity; restrictions on intellectual property and the ability to publish research; constraints on Rothamsted's ability to be transparent about its work and funding, and the associated risk to public reputation; and restrictions on its ability to do research for the benefit of the public good. These concerns drove the development of the draft guiding principles at each workshop.

Underlying their concerns was, perhaps, a general perception of industry as a negative influence, motivated purely by profit. This perception could be due, in part, to the emphasis placed on the tensions that arise through academic-industry collaborations, as well as any particular perceptions of industry that participants may have brought into the room with them. For example, some large multinational corporations were named by participants in the context of having a negative socio-economic, ethical or environmental impact, and one participant asked, "*Are we talking big business here?*" This was addressed by Rothamsted representatives, who commented that working with large companies is not necessarily a negative thing to do, that large companies can bring a lot of benefits to research, and that Rothamsted works with a wide range of industry partners, ranging from large companies to small enterprises to farmers. However, it is helpful to note this as a potential underlying perception that may have influenced some of the discussions.

Aside from these concerns and in addition to the recognised financial benefits, over the course of the dialogue, participants also began to identify other values in a relationship between Rothamsted Research and industry. This was prompted by some of the examples provided by Rothamsted representatives in the plenary and small group discussions, about the ways in which Rothamsted's research can be applied through working with industry. It was also prompted by stakeholders noting that changes in the UK research evaluation framework mean that attaining public research grants is ever more dependent on demonstrating the impact of research, and, as one stakeholder explained, "*grants clearly aligned to industry have a clearer path to impact*". These examples and comments from stakeholders enabled participants to identify that working with industry has benefits such as access to industry's product development and marketing know-how. Participants saw this as a means by which Rothamsted could maximise the practical impact of its research, and make a stronger contribution to tackling agricultural problems related to food security and climate change. As such, participants identified that working with industry can be a way to help Rothamsted deliver work that has public benefits.

Participants identified that developing closer links with industry may entail a shift for Rothamsted, away from its focus on influencing government agricultural policy and towards commercialising research. In this context, the reciprocal transfer of knowledge and research skills between Rothamsted and industry was seen by participants as a way for Rothamsted to increase its impact and to make positive contributions to 'the public good'. Some participants felt that industry and Rothamsted could benefit from a "*symbiotic*" relationship, with industry drawing on Rothamsted's research expertise and knowledge, and Rothamsted drawing on industry's access to resources, technology and commercial know-how.

Chapter 4 Rothamsted's relationship with industry

4.1 Introduction

This chapter presents a summary of participants' views on how Rothamsted Research should conduct its relationship with industry.

Many of the discussions summarised in this chapter focussed on the tensions rather than on the benefits of working with industry. This is because, as outlined in the previous chapter, the typical tensions that arise in academic-industry collaborations were presented at the beginning of the public workshops, and were further illustrated by the case studies^{xvi} outlined in the Methodology chapter. This approach enabled participants to develop guiding principles that they felt would mitigate these tensions.

It is also useful to note that the discussions suggested that participants predominantly saw industry as large manufacturing or chemical companies, even though, as outlined in the previous chapter, the wide variety of Rothamsted's industry partners was presented to participants during the dialogue. This could be due to the examples provided in the case studies, the focus on the tensions inherent in working with industry, or any external perceptions of industry that participants already held.

To demonstrate how the public's views developed through the dialogue and how their discussions led to the sets of draft guiding principles (see Appendix 3, and the boxes in the margins of this chapter^{xvii}), this chapter draws together the views and concerns raised across the public, stakeholder and collaborative workshops during small table and plenary discussions.

We present the findings in this chapter under five overarching themes:

1. Working for the public good
2. Independence and integrity
3. Transparency and public involvement
4. Open access to results
5. Reconciling idealism and pragmatism

The five themes emerged through a combination of 'scene-setting' during the dialogue, and the discussions that developed among participants as a result, including their interactions with stakeholders and experts.

Throughout this chapter, 'participants' refers to the members of the public who attended the workshops, but we have also included the input from stakeholders where this had an impact on the development of participants' views, or where there were particular areas of agreement or disagreement between public participants and stakeholders.

In order to place participants' guidance for Rothamsted in context, the first four sections of this chapter begin with a summary of the level of support for the theme, including the ways in which they explained the different concepts. This is followed by a summary of any identified constraints posed by working more closely with industry, and each section concludes with a summary of the kinds of measures that the public suggested Rothamsted could implement as part of any guiding principles that are developed by the institute. The chapter ends with a discussion of how to balance idealism and pragmatism when drafting the guiding principles for Rothamsted's work with industry.

4.2 Working for the public good

This section summarises the discussions relating to Rothamsted being able to continue to work for the 'public good' while working more closely with industry. The scenario presented in case study one, in particular, seemed to influence the development of this theme. However, participants also felt that, as an institute that is both publicly funded and has charitable status, it is important that the work undertaken by Rothamsted has some benefit to the public.

4.2.1 Importance of working for the public good for Rothamsted's work with industry

The concept of 'the public good' came up frequently in both of the initial public workshops and continued to develop throughout the dialogue. There was particular concern that there should be humanitarian access to research irrespective of other contractual arrangements with industry. In light of their general support for Rothamsted's work, many participants felt that Rothamsted's ability to maintain its position as an independent research institute was in the public good, due to the scope of its research.

The term 'humanitarian' was introduced to participants in case study one, which is likely to have influenced its use, but participants used the term in several ways. At times, participants referred to 'humanitarian' in the context of emergency or crisis aid and support, while others referred to examples such as supporting small-scale farmers in developing countries. However, the use of the term sometimes had a broader context that was conflated with the terms 'public good' and 'public benefit' without a clear distinction between them^{xviii}.

Stakeholders broadly agreed with the idea of having a guiding principle related to working for the public good, but they noted that the term 'public good' needed further definition and a more nuanced description. Therefore, in the final collaborative workshop, participants were asked to explain how they defined this term. These definitions and discussions are described below. However there was also acknowledgement from several participants that the concept of 'public good' is hard to pin down, and some noted that it may change and need to be reviewed regularly.

Many comments about what working for the public good means for Rothamsted Research related to the idea that work that has benefits for the public should be prioritised more highly than any commercial interests, particularly because Rothamsted uses public funding and has charitable status. Comments about the need to reserve the

Case study 1

In case study one, Rothamsted is approached by a pharmaceutical company interested in building upon the results of previous publicly funded Rothamsted research to develop a new mosquito repellent (with potential for humanitarian use in areas where malaria is endemic).

The company offers Rothamsted a 1% share in global profits and demands exclusive ownership of all results, with veto rights over publications.

See Appendix 5 for the full case study text.

Principles relating to working for public good from public workshops

Humanitarian access to results
– if it is going to benefit society

Any work undertaken with industry must be subject to a 'humanitarian usage clause'

People's safety is important

Only work with companies which benefit society

Introduce 'veto power' if results are not used for public benefit

If public money leads to private profit, some profits should return to public

Money made from products developed using public information (based on previous public research) should generate some public re-investment

Stick to charity guidelines

right to use research outputs for humanitarian purposes, regardless of exclusivity periods, were common, as was the idea that the public good should be global in context, not just about the UK. Participants also felt that anyone should be able to use Rothamsted's outputs, not just companies, for example, that small-scale farmers all over the world should have access to the research to help them improve their methods.

"Should be for public good if it's publicly funded" (Exeter public workshop discussion)

"Public good/humanitarian usage - should be global perspective not just UK" (Table 5, Collaborative workshop output)

"Rothamsted to work for public good - benefit global society" (Table 3, Collaborative workshop output)

"'For the public good' should be a concept which can be exploited by anyone without profit (such as farming methods) and not a chemical substance which would need to be exploited by a company" (Collaborative workshop output)

Examples of working for the public good often referred to improving food for the world's population, and having environmental benefits, which is likely to be due to the nature of Rothamsted's agricultural work. Others defined working for the public good as having a positive impact on people's lives, and working "selflessly" for the benefit of others.

"Any knowledge that will help with issues that most of the public care about, in this instance, nutrition, environment"

"Humanitarian help. Empowering individuals to feed themselves more healthily, more sustainably and more cost effective"

"Government aims of food security, reduced CO2 (e.g. biofuels) and keep people healthy are a good guide to this"

(Collaborative workshop outputs)

Other comments about the public good included the need for Rothamsted to think about the long term socio-economic, environmental or health-related impacts of its research and make ethical decisions based on both the long and short-term. Some participants noted that it may be more important for Rothamsted to focus on not doing harm rather than solely on having positive outcomes, but there was some disagreement about this as some felt this could lead to Rothamsted working on "pointless stuff", that is, work that is neither good nor bad. Others commented that Rothamsted should involve the public in defining and deciding whether a project is in line with the public good.

Stakeholders asked whether economic benefits would be considered to be for the public good, and whether participants felt that funding research was a public good in itself. In response, Rothamsted's sustainability as a research institute was also discussed in the context of being part of a definition of the public good. Several participants felt that if Rothamsted does some work with industry that provides

Principles relating to working for public good from stakeholder workshop

Stay true to original Rothamsted mission statement versus taking up opportunities for broadening work for public good

Principles relating to working for public good from collaborative workshop

'Humanitarian usage clause' – when appropriate

RRes should work for the public good on the basis of ethical criteria (included in BBSRC criteria) - check companies' 'code of conduct'

Public will receive benefit from research through money being re-invested in RRes

Include a humanitarian usage clause where appropriate

RRes to work for public good
- Benefit global society
- Government aims of food security, reduced CO2 (e.g. biofuels) and keep people healthy are a good guide to this

Money generated can go back to RRes to be used for public good

funding and therefore enables it to continue and improve its work for the public benefit, then accessing industry funding in itself could be seen as being for the public good.

A summarised principle related to humanitarian access to research was produced at both the public workshops, and featured as the most popular draft principle in Exeter and in the top three in Harpenden. Furthermore, in the final collaborative workshop, each of the five small groups included a draft principle about public good or humanitarian usage, and the most popular of the final draft guiding principles by far was one stating 'Reserve right to humanitarian access', which attracted 25 votes (in comparison to 15 votes for the second most popular draft principle).

4.2.2 Industry constraints on Rothamsted's ability to work for the public good

Although participants recognised that working with industry has benefits such as being able to apply the research, a perceived tension between Rothamsted's desire to have a positive impact on the public and the need to attract funding from industry was discussed frequently throughout the dialogue. Many participants felt that the need to work more closely with industry carried a risk that Rothamsted could be drawn into more profit-making work and away from work that could have humanitarian benefits or that which is intrinsically valuable. Similarly, there was a concern from a stakeholder that the need for funding could affect how research is prioritised, with industry-funded research being prioritised over publicly-funded research.

These concerns suggest that, despite their overall support for Rothamsted's work with industry, participants think profit-making products could constrain the ability for Rothamsted to work for the public good. This may relate to a wider perception of large corporations having negative environmental and social effects, as discussed in the 'Defining the dialogue context' chapter, although time did not allow for further exploration of views on this matter.

"Rothamsted seem confused - is it for commercial interest or is it for public benefit?" (Exeter public workshop discussion)

Participants were also concerned that Rothamsted could be "tempted" to work with industry partners with questionable ethical records in order to gain access to funding. In response to case study one, some participants felt that Rothamsted might decide to work with the company in question because of the potential to develop a product that could combat malaria, but that in practice, the company could exploit the research for profit-making purposes, by selling it to consumers rather than providing it to developing countries as a humanitarian intervention.

Exclusivity agreements about intellectual property were raised as a concern in the context that they could have a negative impact on Rothamsted's ability to work for the public good, because if a company has sole rights to research outputs, the research might not be used to benefit the general public, and opportunities for further research and knowledge sharing could be restricted.

4.2.3 Measures to ensure Rothamsted is able to work for the public good

Participants identified a number of measures Rothamsted could use to ensure that it is able to work for the public good while working with industry. A principle among these was the establishment of a humanitarian usage clause in all contracts. This is discussed below along with other suggestions.

(i) Establishing a ‘humanitarian usage clause’

Establishing a “*humanitarian usage clause*” in partnership contracts was the most commonly suggested measure to safeguard Rothamsted’s ability to work for the public good, and this initially emerged in both the public workshops, in response to case study one. Participants described how such a clause would allow for the research to be used in situations where it could have an immediate benefit for people in need or in an environmental emergency, irrespective of any other contractual agreements with the company in question. As well as being seen as an important part of contract negotiations, some participants at the Harpenden public workshop also saw the use of research for humanitarian purposes as a “*duty of care*” for both Rothamsted and industry companies. One group at the Exeter public workshop suggested establishing a categorisation system whereby certain research projects categorised as “*public benefit or greater good*” projects were set aside for public funding, as a way to alleviate the perceived tension arising from working more closely with industry.

There was also some agreement from stakeholders about the need to negotiate humanitarian access as part of intellectual property agreements between Rothamsted and industry, with some noting that this kind of discussion already takes place between industry and Rothamsted.

“Any work undertaken with industry must be subject to a ‘humanitarian usage clause’” (Harpenden public workshop output)

“IP censorship: need to negotiate humanitarian access” (Stakeholder workshop output)

“Rothamsted should reserve the right to make research available to support humanitarian activities” (Table 4 Collaborative workshop output)

However, there were some challenges to the idea of a humanitarian usage clause, particularly as the discussions around this theme were elaborated upon during the collaborative workshop through the interactions between public participants and stakeholders. These challenges were predominantly due to problems with defining what humanitarian usage would be, particularly in the context of Rothamsted’s agricultural focus, where the benefits would most likely be long-term rather than being of use in the kinds of crisis situation brought to mind by the term ‘humanitarian’. There was also some discussion as to whether a humanitarian usage clause in a contract would be of any benefit or attraction to industry partners.

Further principles relating to working for public good from collaborative workshop

Contracts should ensure RRes, industry and the public can all benefit symbiotically - remember the public

RRes should balance commercial interests and the ‘public good’. If it’s not clear the decision should be reported up - Including ethical criteria for partners - ‘Public good’ can and should be reviewed periodically

RRes should reinvest its profits in work that conforms to these principles

RRes should reserve the right to make research available to support humanitarian activities. Needs more definition e.g. crisis

RRes’s sustainability (ability to continue) should be included in the concept of ‘public good’

Should not do anything that might affect its charitable status

(ii) Reinvestment mechanisms

Another commonly suggested measure to safeguard the public good was the idea of reinvesting any profits from industry partnerships back into Rothamsted's research work, although there was some variation in views on this issue, as outlined below. This idea of reinvesting profits first arose at the Harpenden public workshop, where a draft guiding principle relating to returning profits to the "*public purse*" was the second most popular at the end of the workshop, not least since Rothamsted's infrastructure is taxpayer-funded.

These discussions developed further during the collaborative workshops where some felt that reinvesting money into Rothamsted's work would, in turn, have public benefits, with the additional advantage of knowing how the profits were being used. However, others suggested that this money should be returned to government as a way of "*repaying*" some of the government grants Rothamsted receives. Similarly, some suggested that if Rothamsted were to receive more industry funding it would therefore need less from the government, which would indirectly benefit the public in other areas.

*"When there is taxpayer funded research could there be a % return to the government?"
(Harpenden Public workshop discussion)*

*"Money should come back into Rothamsted so that is where the public benefits"
(Harpenden Public workshop discussion)*

"The money should stay with Rothamsted to invest in something we know is beneficial - we don't know what the government would do with it. If Rothamsted kept all money earned from their research projects, they could do more research and invest in other work" (Collaborative workshop discussion)

(iii) Ethical partnering decisions

As discussed later in the 'Independence and integrity' section, establishing partnering criteria was suggested as a way to navigate the tensions between working with industry and working for the public good. In this context, suggested partnering criteria were mainly related to a company's ethical track record, their code of conduct, or whether they had paid their taxes, which participants felt should be investigated before agreeing to a partnership. Some participants at the Exeter public workshops went a step further and indicated that Rothamsted should only work with "*companies that benefit society*", while one group at the collaborative workshop specified some areas Rothamsted should investigate:

"Avoiding companies with questionable track records re environment, human rights and working conditions in the UK and abroad" (Collaborative workshop output)

During these discussions, participants moved away from discussing industry in a way that conflates "*big business*" with negative social and environmental practices. They explored the topic of ethical partnering decisions with a focus on how an individual company behaves in practice.

(iv) Assessing risks to ensure work contributes to public good

Undertaking thorough risk assessments also arose in the context of Rothamsted's ability to maximise its understanding of the potential scientific, ethical, socioeconomic and environmental implications of research projects, and therefore safeguard its ability to work for the public good. Participants were keen to ensure that such risk assessments address both long and short-term implications of their work. For example, one group at the collaborative workshop identified four main areas to be taken into account when taking account of potential risks:

"Will you find a useful result? Risk of the project not working.

Will the results be commercially viable? Risk of the project not finding anything valuable, or of finding something very viable which is then embargoed (e.g. students and researchers not being able to publish).

Will it be immediately harmful? Risk of the project finding something dangerous.

Will it be harmful in long term/wider world? E.g. changes to ecosystems like wheat growing"

(Collaborative workshop output)

(v) Other measures

Early in the dialogue, some participants suggested that Rothamsted should have "veto power" whereby a company cannot "sit on" research results that could have a public benefit but that are not being used in such a way by the company in question.

In response to information from a Rothamsted representative that the Biotechnology and Biological Sciences Research Council (BBSRC) has a code of conduct^{xix}, under which a lot of Rothamsted scientists are covered, some participants felt there was potential to build upon these existing principles, although one group stressed that it was important to be committed to following such a code of conduct – not just having one written down.

One group at the collaborative workshop suggested that Rothamsted could also explore including charities in its industry collaborations as a way to ensure there is some public benefit to the partnership. For example, a humanitarian charity could be offered free access to medication from an industry company as part of the partnership arrangement with Rothamsted.

4.3 Independence and integrity

Rothamsted Research's independence and integrity emerged as an important theme throughout the workshops and this section summarises these discussions. Broadly speaking, the scenario presented in case study two, in particular, influenced the development of this theme.

4.3.1 Importance of independence and integrity for Rothamsted's work with industry

Case study 2

In case study two, Rothamsted provides public comments that dismiss suspected negative impacts of a pesticide developed by a private company upon local Salmon stocks.

However, Rothamsted's credibility and independence is put in doubt by the fact that the institute has received funding from the company in question in the past.

See Appendix 5 for the full case study text.

Independence and integrity first arose as a theme at the public workshops, but continued throughout the dialogue as participants discussed the need for Rothamsted to maintain the quality, integrity and status of its scientific research, and its status as an independent voice. Participants considered it important both for Rothamsted to be *able* to act independently of industry influence, and to be *seen* to be doing so in order to protect its reputation as an independent public body.

The concept of independence and integrity was frequently viewed as Rothamsted being able to make claims that are not influenced by its relationship with industry. These comments were often related to concepts of scientific rigour and quality. Participants noted that objective, evidence-based statements are signs of independence, and that Rothamsted should be able to make public statements against government policies or industry products and practices, as long as any such claims were based on high quality science.

"It's not their job to defend the company, only defend the science" (Harpenden public workshop discussion)

"Should RRes work for financial gain? No - their integrity is more important and more valuable than money" (Collaborative Workshop Discussion)

Participants also felt that Rothamsted should be able to continue to make decisions with integrity, and in line with its overall mission. They felt that Rothamsted's decisions about what to work on should not be influenced by its relationship with industry, and that its decisions about who to work with should not be based solely on financial pressures.

The discussions also suggested that participants thought it was important for Rothamsted's independence and integrity to be visible. For example, there was discussion throughout the dialogue about the need for Rothamsted to be seen to act responsibly and proactively in situations where its expertise can add value or clarity to a contentious issue or debate. Participants linked this to the importance of public trust. Rothamsted's reputation and credibility as an independent research institute were seen as fundamental and valuable assets that should be protected by including independence and integrity in the guiding principles for working with industry.

"Integrity of the institution must remain intact in the event of debate in the public domain" (Exeter public workshop output)

"Guiding principles need to enshrine independence so that credibility can be maintained" (Table 3, Collaborative workshop discussion).

"RRes will always maintain on independent, unbiased internally agreed views" (Table 1, Collaborative workshop output)

Several outputs from the small group activities in the final collaborative workshop included concepts of independence and integrity, and these were summarised into one guiding principle at the end of the workshop. This summarised draft guiding principle

Principles relating to independence and integrity from public workshops

Ensure independence and integrity

RRes will only work with companies that meet specific ethical criteria

encapsulating independence and integrity received a total of nine votes^{xx}, placing it in the middle of the scale of final prioritised principles (see Appendix 3).

4.3.2 Industry constraints on Rothamsted's ability to maintain independence and integrity

Participants identified a number of risks to Rothamsted's independence and integrity posed by working more closely with industry. Some worried that working with industry would inhibit Rothamsted's ability to work freely, whilst others felt that even if Rothamsted could act independently, working with industry would still damage its independent reputation. A few participants believed it was not possible for Rothamsted to work with industry and maintain an independent reputation.

In terms of Rothamsted's ability to act independently, participants identified a potential for increased levels of industry control over research areas and outputs, and that this could lead to situations where Rothamsted's *"hands are tied"*. However, a stakeholder in one of the collaborative workshop groups also pointed out that government funding usually comes with constraints too, so constraints and criteria are not problems solely to do with working with industry. Some felt that Rothamsted should not put itself in a situation where there could be a loss of independence, irrespective of how much funding it could attract as a result. Similarly, at the collaborative workshop, some noted that Rothamsted should not *"be side-tracked from [its] main mission, even for lots of money"*. However, some stakeholders were keen to highlight that industry also places value on Rothamsted's independence so they would not want to undermine this. Some stakeholders also stated their agreement that Rothamsted should *"deal with science and don't get involved in the marketing"*.

There were differences of opinion on whether it was even possible for Rothamsted to be independent whilst working with industry. Some participants were concerned that contractual agreements with industry partners could mean that if information came to light that a particular product was harmful in some way, Rothamsted might be prevented from disclosing this. Indeed, early in the dialogue, some noted that, by definition, if some of Rothamsted's projects are dependent on industry for funding and taking products to market, it is not possible for them to be truly independent.

"Either work with industry or act as independent, you can't do both" (Exeter public workshop discussion)

However, there was some disagreement here, and other participants felt that even if Rothamsted Research is not financially independent of industry, it can still be academically independent and therefore maintain an independent voice.

In terms of Rothamsted's integrity and its reputation as an independent voice, participants also identified a risk to public perception and trust. Participants felt that if Rothamsted's independence and integrity were to be publicly called into question as a result of its closer association with industry, this would have a long-term impact on its

Principles relating to independence and integrity from stakeholder workshop

Only comment on independently verified research versus be open about defending your research

Think of integrity, credibility and public trust. Safeguard independence and quality of science

Principles relating to independence and integrity from collaborative workshop

RRes will always maintain on independent, unbiased internally agreed views

RRes should be consistent in how it engages with different partners and engages with a wide range of partners

Don't be side-tracked from main mission - even for lots of money

Don't put too many resources on one project

Work with a broad range of industry partners at any one time

Don't lose track of RRes's mission (that already exists)

When deciding whether to work with a company consider all areas of work that the company is involved in

Need to maintain independent voice

Ok to work with all types of companies so long as the work contributes to public good and is in line with other principles - not all companies, reputation risks involved

RRes should consider risks of collaboration projects, both research and commercial

reputation. Similarly, participants suggested that there is a perceived conflict of interests in such collaborations that could damage Rothamsted's reputation as an independent institute, since industry was viewed as being motivated by profit, while participants felt that Rothamsted should not be motivated by money.

Rothamsted's need to attract more funding from industry was seen to carry a risk that decisions about which companies to work with could be driven by financial pressures, rather than making decisions driven by Rothamsted's core mission and values, and that therefore there is a risk to Rothamsted's integrity.

4.3.3 Measures to ensure independence and integrity

Participants identified a number of measures Rothamsted could use to ensure that it is able to maintain its independence and integrity while working more closely with industry. The establishment of partnering criteria and diversifying its industry funding and partnership portfolio were two popular suggestions, among others discussed below.

(i) Establishing partnering criteria

Establishing criteria against which all potential industry partners are assessed prior to deciding whether to work with them was the most commonly discussed measure to ensure independence and integrity. This general suggestion emerged in both the public workshops and the discussions developed further during the collaborative workshop, resulting in a number of different standpoints on this issue. Some participants felt that all potential and existing partners should be assessed and treated consistently. Most frequently, the suggested criteria included an ethical element, in light of the value placed on the need to work for the public good, as discussed earlier in this chapter. Conversely, other participants felt that each potential partnership should be assessed on a case-by-case basis, based on merit and need at the time, rather than on rigid criteria.

Stakeholders provided feedback that implementing consistent partnering criteria would be problematic in practice due to the complex nature of different company governance structures. As a result, at the collaborative workshop, project-based criteria were suggested, such that each potential project is assessed against Rothamsted's mission or objectives, irrespective of the nature of the company. Some felt that, as a result, Rothamsted's integrity in decision-making would be easier to defend, should the company in question be exposed as having questionable practices or ethics. However, there was some disagreement in this area due to the risk of damaging Rothamsted's reputation as an independent voice by being implicitly linked to companies with a negative image, and the feeling that there should be "*an ethical boundary*" that should not be crossed. Some participants cautioned that Rothamsted would be in danger of becoming a "*designer company*", by which they meant a company that changes its guidelines depending on the project.

"It doesn't matter what the company does, so long as the work is good work. Work should be judged on the basis of each project, not on the basis of the people commissioning the work"

“There should be limits to the types of companies if they were too bad. One reason for this is that working with a bad organisation can be seen as implicitly endorsing their other work, thus threatening the independent voice and reputation of Rothamsted Research”

(Table 3, Collaborative workshop discussions)

(ii) Diversifying industry funding portfolio

At the collaborative workshop, some participants suggested that Rothamsted should diversify its industry funding and partnership portfolio, to avoid being overly dependent on a small number of large companies. Having a wide range of different types of industry partner was seen as a way to enable Rothamsted to make decisions that safeguard its independence and integrity, and avoid needing to make decisions based solely on financial pressures. Some participants suggested having a cap on the proportion of funding Rothamsted received from industry, to avoid it being “held to ransom” and to ensure it doesn’t become a contract research organisation. They were reassured when Rothamsted representatives clarified that the aim is to have no more than 20% of their funding coming from industry.

(iii) Assessing risks to ensure independence and integrity

As discussed under some of the other themes in this chapter, participants felt that decisions to undertake collaborative projects should be informed by clear risk assessments and forward planning. In some of the discussions about this topic, this recommendation was linked to concerns about ensuring the quality and integrity of Rothamsted’s science, the need to minimise any constraints on future research that might arise from the terms and conditions of their work with industry, and the need to avoid reputational risks from the collaborations.

Some stakeholders responded negatively to these suggestions, particularly regarding long-term risk assessment, arguing that future implications and risks are very difficult to determine accurately due to the relatively open-ended nature of scientific projects. In response to this feedback, participants at the collaborative workshop accepted that not all risks could be anticipated, but felt that “good management” should attempt to build risk assessment into contracts anyway.

(iv) Other measures

Other suggestions arising in the different workshops included Rothamsted Research not providing public comments where they have been directly or indirectly involved in research that has led to an issue or challenge.

Some participants suggested Rothamsted could seek advice on how to work with private companies whilst keeping in line with its charitable status, for example, from medical research charities that are likely to have encountered similar tensions.

Others felt Rothamsted should make a judgement about whether to make public statements on behalf of the institute as a whole, as a single department or as an

individual scientist, based on the situation in question and the nature of the relationship with any industry partner involved.

4.4 Transparency and public involvement

The importance of transparency about the nature of the work Rothamsted Research undertakes and how this is funded was a frequent theme throughout the workshops. Participants also wished to see a greater level of public involvement in Rothamsted's decision-making. The scenario presented in case study two, in particular, seemed to influence the development of this theme.

4.4.1 Importance of transparency for Rothamsted's work with industry

There was significant agreement from participants from an early stage in the dialogue that transparency, being open to scrutiny and public involvement in decision-making are important in the context of Rothamsted's work with industry. Participants felt that, as a publicly funded research institute in receipt of UK taxpayers' money, these issues are an important aspect of accountability to the public.

(i) Transparency

There was a strong feeling among participants that Rothamsted should be open about who it is working with, what it's working on, the intended aims of the research, who the beneficiaries might be, and what the sources of funding are. They felt this was particularly important due to taxpayers' money being used. Participants in one group at the collaborative workshop said they would want to know how the research would benefit UK taxpayers specifically.

Stakeholder feedback was that transparency about what Rothamsted is working on could be problematic due to confidentiality agreements with industry partners. In response, several participants at the collaborative workshop noted that they understood why this could be the case but maintained that there should still be information available in the broadest sense even it is not possible to go into detail.

"Rothamsted Research should be open and transparent as an organisation - about its funders, commercial interest, profits, conflicts of interest" (Table 4, Collaborative workshop output)

Some participants also discussed the need for Rothamsted to be open to external scrutiny and criticism and felt this would ensure it maintains a good reputation.

"All of Rothamsted's projects must always be of highest level of transparency to maintain ongoing reputation" (Exeter public workshop output)

Principles relating to transparency from public workshops

RRes will be open and transparent about who is benefitting from their research

Any potential conflict of interests will be declared

Get public input into decision making

Before any contract is agreed all possible implications will be assessed (across whole organisation, long & short term)

Principles relating to transparency from stakeholder workshop

Keep all parties informed of commercial development (transparency)

(ii) Public involvement

Principles relating to transparency from collaborative workshop

RRes's methods and results will be subject to independent review e.g. audit, peer-review

RRes should be open and transparent - about funders, commercial interest, profits, conflicts of interest

Open and transparent communication should be built into planning and implantation of research at an early stage

RRes should involve the public in its work - seek opportunities to do so actively, layman's terms

RRes should consider public views (webpage 'have your say')

RRes should educate and actively involve the public to help inform decision-making

Continue to be transparent about who its working with and broadly what its working on

RRes needs to communicate its message effectively in the media and to the public

RRes should be transparent, credible and trustworthy (communicate findings accessibly; need scrutiny from various places, but not necessarily from public)

Participants generally supported public involvement in Rothamsted's decision making. Whilst recognising the practical challenges of doing this, many of which were raised by stakeholders, most felt that some degree of involvement was important given that decisions involve taxpayer money. However, participants did not go into detail about the level of decision-making they thought the public should be involved with, and there was not time to explore this further. Some specific suggested methods to involve the public suggested are referred to later in this section.

Public involvement in Rothamsted's decision making was discussed at length at the collaborative workshop, even though the comments in the first public workshops were relatively brief. In the initial public workshops in both Exeter and Harpenden there were a small number of comments about involving the public in decision-making, due to taxpayers' money being spent on the research undertaken by Rothamsted.

"Get public input into decision making:

-Collective thinking - everyone involved in decision making

-Public involved in decision making process

-Taxpayers have a vote on where money is spent" (Exeter public workshop)

Participants also felt that anyone who might be affected by Rothamsted's research should be kept informed and involved. This arose in response to case study two whereby participants thought the fishermen in the case study should be involved in the research at an early stage and should be kept informed, because their livelihoods would potentially be affected by the research results.

As a result of these discussions, one of the summarised guiding principles at the end of the public workshops was 'Get public input into decision making'.

At the stakeholder workshop there was disagreement with this draft principle. Stakeholders questioned whether public involvement would be workable due to time constraints, practicalities, and whether the public would be able to make realistic decisions. Some noted that there is already a board of trustees to provide this kind of oversight, and others suggested that perhaps more general communication and interaction with the public is needed instead.

This feedback from stakeholders generated a significant level of discussion at the final collaborative workshop. At this workshop several participants disagreed with the

stakeholder feedback because they felt that practical challenges should not be a barrier to attempts to involve the public, and that it was wrong to assume what the public would not be interested in or able to get involved with the work of Rothamsted. However, some also acknowledged that there must be an appropriate balance between public involvement and the need to make decisions in a timely way, as well as recognition that organising activities to involve the public will also cost money, and that this needs to be a consideration. As a result, many participants agreed that public opinion should be used to inform decision-making, but that the public should not have the power to make the decisions themselves.

“RRes should consider public views - need to consider public input during the decision-making process (public input is important and should be considered, but it cannot be binding)” (Table 1, Collaborative workshop output)

Having said that, there was some variation in viewpoints on the issue of public involvement, and indeed one output from the small group discussions was as follows:

“Need scrutiny (from various places), but not necessarily from public” (Table 3, Collaborative workshop output).

Three out of the five small groups at the collaborative workshop included a draft guiding principle incorporating public involvement at the end of the event. Furthermore, the final summarised draft guiding principle about involving the public to inform decision-making was the fourth most popular among public participants.

4.4.2 Industry constraints on Rothamsted’s ability to be transparent

The main concern related to transparency was that in working more closely with industry, Rothamsted research’s reputation might be at risk as a result of a change in public perception. Participants felt that if industry placed restrictions on Rothamsted’s ability to share information about their work and the nature of their collaborations with industry, the level of public trust could be damaged as a consequence.

“Lack of trust can “snowball” as people think, if the information is not publicly available on one issue, what else are they hiding?” (Harpenden public workshop discussion)

4.4.3 Measures to ensure transparency

A number of measures to safeguard transparency were suggested, and these included practical suggestions for how to involve the public in order to inform decision-making; ideas for improved communication with the public; being open to external scrutiny; declaring conflicts of interest; undertaking thorough risk assessments, and guidance for how to interact with the media.

(i) Methods to involve the public in decision-making

There were a number of suggestions for ways in which Rothamsted could involve the public, in order to inform decision-making. These included having a member of the public on Rothamsted’s board of trustees; using technology to engage with the public online, such as a “*have your say*” section on the website; involving the public in Rothamsted’s work on influencing government policy; holding regular open days; and holding “*debate-style*” events to enable two-way discussion rather than one-way information-giving. However, there was not sufficient time at the workshops to explore these ideas and methods further with participants.

“RRes should educate and actively involve the public to help inform decision-making” (Table 5, Collaborative workshop output)

(ii) Communication with the public

The suggestion from stakeholders that better communication and interaction between Rothamsted and the public could be more appropriate than involving the public in decision-making was further developed by participants in the collaborative workshop. Although, as discussed above, several participants disagreed with the feedback that public involvement in decision-making was impractical, there was general agreement that Rothamsted could do more to raise awareness and communicate to the public about its work. They suggested that more could be done to educate the public about the research taking place, and that clear and transparent communication of information was important. They also noted that any public information should be accessible in terms of language, terminology and format, and some suggested that information could focus on the practical application of research findings in order to be most accessible.

“RRes should involve the public in its work - seeking opportunities to do so actively and considering layman’s terms etc.” (Table 4, Collaborative workshop output)

(iii) Independent evaluation and scrutiny

The role of independent evaluation or peer review was also frequently discussed in the public workshops, in the context of being visibly open to external scrutiny. There was particular support for this to take place in any instances where Rothamsted’s science is being challenged, such as in the scenario presented in case study two. There were some comments from stakeholders that existing structures already incorporate independent reviews, which helped the public participants to develop their understanding of Rothamsted’s operations and identify the implications for its work with industry. Some participants at the Exeter public workshop and at the collaborative workshop suggested that an independent body could also be of benefit in cases where there is dispute between Rothamsted and an industry partner, for example, about whether information is commercially sensitive or not.

(iv) Declaring conflicts of interests

Participants at the Harpenden public workshop suggested that declaring any conflicts of interest would be an important measure to ensure that Rothamsted continues to be seen as an open, transparent and trustworthy institution, and again this was prompted by the scenario in case study two in particular. For example, if Rothamsted was to write a press release relating to an area of work or company it has worked with previously, some participants felt that this should be clearly stated in the press release. As these discussions developed during the collaborative workshop, some also noted that Rothamsted should ensure that its mission is communicated explicitly to all potential industry partners in advance of any contractual agreements, including an open discussion about potential conflicts of interest.

(v) Transparent risk assessment

As discussed under some of the other themes in this chapter, the topic of risk assessment arose during the workshops in several different contexts. At the Harpenden public workshop, participants focussed some of their discussions on the idea that risk assessments should be transparent and inclusive, taking into account potential impacts

of a particular collaboration upon all areas of Rothamsted Research. To do this, they felt it was important that Rothamsted staff and researchers are consulted on the terms of a contract and on the potential implications of undertaking a research project with an industry partner.

“When setting the terms of the contract it should not just be the guy at the top – it needs to be the whole organisation” (Harpenden Public Workshop Discussion)

“Test contracts internally to look for problems: when agreeing contract terms with industry Rothamsted must take on board views of people on ground” (Harpenden public workshop output)

(vi) Interactions in the media

At the Exeter public workshop there were some concerns about the need to be careful “on airtime” in order to safeguard Rothamsted’s reputation. Similarly, some participants at the collaborative workshop warned against Rothamsted “fighting battles” in the media, suggesting it “let the work speak for itself”. However, others were in favour of Rothamsted “standing up to” the media if they are being challenged or where negative comments are made.

Participants suggested that being open and transparent is, as a general rule, a helpful way of combating any challenges that arise in the media that could harm Rothamsted’s reputation, as illustrated in case study two.

4.5 Open access to results

Ensuring open access to Rothamsted’s research was a frequent theme throughout the workshops, and this section summarises these discussions. The scenario presented in case study three, in particular, seemed to influence the development of this theme, although case study one was also a point of reference here. Open access refers to the practice of making research freely available to all, generally through online publication.

4.5.1 Importance of open access to results for Rothamsted’s work with industry

Open access to results was considered an important principle to apply to Rothamsted’s work with industry, although participants added caveats based on stakeholder feedback as the dialogue progressed.

There was significant agreement from participants from an early stage in the dialogue that open access to results is important in the context of Rothamsted’s work with industry, with many comments and workshop outputs in support of this. Indeed, at both the initial public workshops and at the final collaborative workshop, there were several comments suggesting that all research should eventually be in the public domain because of the publicly-funded nature of the institute. However, an indication of a reasonable time limit before research becomes openly accessible was not arrived at.

Case study 3

In case study three, Rothamsted researchers face a dilemma whereby their freedom to publish the results of research, develop research proposals and choose research partners is constrained by confidentiality agreements developed with collaborators on a previous project.

See Appendix 5 for the full case study text.

“All research should eventually be in public domain” (Harpenden public workshop output)

At both the Exeter and Harpenden public workshops, some participants felt that a single company should not be given total control over Rothamsted’s research outputs, as they thought this would be against Rothamsted’s overall mission and principles.

Principles relating to open access to results from public workshops

Allow knowledge transfer across sectors

Make information available (open access to results and methods) – With caveat: ‘But allow period for obtaining patents’

Any contractual patent period will have an appropriate time limit

Where Rothamsted science is being challenged but is subject to commercial confidentiality an independent body should have access to findings to evaluate

“Having an IP agreement for life contradicts Rothamsted’s underlying mission” (Harpenden public workshop output)

“The company should not be able to control what goes into the public domain as this is against Rothamsted’s principles” (Exeter public workshop discussion)

Participants felt that Rothamsted scientists should be able to publish their work and that Rothamsted should retain joint ownership of research outputs if a company wishes to apply for a patent. These discussions arose in response to an illustrative example of a PhD student’s inability to publish their work due to industry constraints, and to the scenario presented in case study one where a company had veto rights over publications.

“Researchers should have access to the research they worked on - the IP agreement must have an element of shared ownership” (Harpenden public workshop output)

“Rothamsted should be able to reserve the right to recall and control any intellectual property born as a result of the research” (Exeter public workshop)

There was also a concern that knowledge transfer through open access to results should be encouraged, so that others can benefit from and build upon the research. They identified the particular importance of sharing knowledge with other research institutes, with charities that work in agricultural sustainability, and with small-scale farmers who could benefit from the research results.

In one group discussion at the collaborative workshop, a stakeholder noted that even if the work itself is privately funded, the scientists will have been using publicly funded facilities, so it would not be appropriate to withhold publication indefinitely. However, another group felt that there may be situations where it would be acceptable for a company to have sole ownership of the research, for example if that company has licensed and provided all the funding for the creation of the intellectual property, or if the public would benefit from the company having ownership.

There were also some other challenges, particularly from stakeholders, to the idea of open access to research outputs. For example it was noted that if there was completely open access to research information, Rothamsted could be funding other countries’ economies rather than the UK. There were also some stakeholder comments about a “reasonable” need to hold back information in some instances. For instance, if there was further related research to be done, scientists themselves may want to delay publication until that had taken place. Another example was that a contract might have a “delay clause” whereby it has been agreed in advance that research will not be published for a specified time period. Furthermore, stakeholders noted the difficulties in assigning intellectual property ownership in science, because a piece of research could be used in

Principles relating to open access to results from stakeholder workshop

All data will need to be made public at some point

Consider how working industry may affect research career (not being able to publish)

the future as a basis for other research. They noted that this raises a question about who owns the original data, particularly because in fact all scientific research builds on previous research.

This input from stakeholders helped participants to identify complexities and interdependencies associated with Rothamsted's relationship with industry and these discussions led to a further exploration of intellectual property ownership and publication^{xxi} in some groups at the collaborative workshop, as outlined below.

Some participants acknowledged how difficult it would be to develop a contract which protected against future use of basic research in which Rothamsted might not be involved, but in general participants maintained that although there may be caveats, a principle of open access to results was important.

4.5.2 Industry constraints on Rothamsted's ability to maintain open access to results

Participants identified a number of risks to Rothamsted's ability to maintain open access to results, posed by working more closely with industry. These risks were based on intellectual property ownership and they included restrictions on the ability to publish, and on the ability to share knowledge.

The main concern, arising early in the dialogue, was that industry might impose restrictions on Rothamsted where there is information a company considers to be commercially sensitive, or that industry might take complete control of research outputs through taking ownership of the intellectual property. Participants were concerned that this might prevent Rothamsted from publishing its work or sharing information that could be beneficial to other research institutes, small-scale farmers, or charitable organisations who work in agriculture.

"Company extends control over products developed, has veto power, might have repercussions on Rothamsted, stopping them doing other research, and not publicising the research" (Exeter public workshop discussion).

The impact of industry constraints on Rothamsted's ability to publish were also discussed at length at the stakeholder workshop, where stakeholders commented that some Rothamsted departments are more reliant on industry funding than others and that those that are most reliant on industry funding publish less often. This raised a question about a trade-off between publishing and funding, whereby Rothamsted could have to forego publication in order to attract industry funding in some cases.

Prompted by these examples from stakeholders, at the collaborative workshop, participants noted their concerns about the impact of industry restrictions on individual scientists, who are reliant on the ability to publish their work in order to build their reputation and career and in order to attract more funding. They identified that this would then have a knock-on impact on Rothamsted's ability to build its reputation.

"Consider the impact on the career of individual scientists. Consider publication rights" (Collaborative Workshop Output)

Principles relating to open access to results from collaborative workshop

RRes should ensure appropriate access to results and information - good negotiation at the contract stage

RRes should encourage transferring research skills and knowledge across sectors

Consider the impact on the career of individual scientists - consider publication rights

Proactive approach to knowledge transfer from RRes to research institutions, industry and end users

Data must be published at some point - With agreed time frame – possible guidelines

Should not sign contracts giving company total control/veto (exclusive rights) unless all other alternatives have been explored

Be proactive about knowledge transfer from projects

RRes should be open and transparent about its research – publish all data

4.5.3 Measures to ensure open access to results

Participants identified two main measures Rothamsted could use to ensure that it is able to maintain open access to results while working more closely with industry: establishing an agreed period of exclusive ownership by a company after which all research enters the public domain; and proactively encouraging knowledge transfer to others who could benefit from the research.

(i) Establishing an exclusivity period

There was strong support for the establishment of an agreed exclusivity period whereby a company retains the rights to the research but only for a set period of time such as that needed to obtain a patent, or whereby any patent period is time limited and does not prevent publication. The suggestion of an exclusivity period arose initially at both of the public workshops. Upon further discussion at the collaborative workshop, participants and some stakeholders agreed that this is a pragmatic compromise between industry requirements and Rothamsted's ability to publish all research in the public domain, and that therefore this measure would help Rothamsted navigate the tensions and realities of working more closely with industry. Participants felt that this would support Rothamsted as a whole, as well as the individual scientists who depend on the ability to publish their research in order to advance their careers.

“Make information available (open access to results and methods) – with caveat: but allow period for obtaining patents” (Exeter public workshop)

“Any contractual patent period will have an appropriate time limit:

-Must be time limited (but limit will vary project to project)

-Cap on exclusivity period. Then it becomes public

-Patent should not stop Rothamsted building on the knowledge of that research” (Harpenden public workshop)

“Reasonable to wait for a patent – presumably a matter of months. Not only reasonable but sensible as Rothamsted ought to profit financially from its input where reasonable” (Exeter public workshop output)

“It's about sharing the reward - if RRes gets a share of the license they can use this to fund further public research” (Harpenden Public Workshop Discussion)

There was some discussion about an appropriate timescale for this exclusivity period, with general agreement that it should be based on the particular project and partnership, and that the timescale should be clearly articulated in contracts. Several participants made connections to the need to place a high value on Rothamsted's services, by ensuring the institute secures a share of the intellectual property, as discussed further in the 'Reconciling idealism and pragmatism' section.

(ii) Encouraging knowledge transfer

Being proactive about knowledge transfer was another suggested measure, arising initially at both of the public workshops. At the collaborative workshop, following further discussion, the ability to share knowledge about the practical applications of the

research was seen to be particularly important, and participants felt that this should take place across different sectors and audiences, including other research institutions, industry partners, end users such as farmers, and relevant charitable organisations.

Stakeholders agreed that knowledge sharing is important, but their comments focussed more on the need to maximise training and development opportunities for junior scientists, and to support networking and relationship-building opportunities through collaborative projects with industry. Several participants at the collaborative workshop supported this suggestion about paying attention to the careers of individual researchers.

“Individual researchers need to be able to make their name” (Collaborative Workshop Discussion)

4.6 Reconciling idealism and pragmatism

Most of the principles discussed in this chapter so far carry a moral or ethical weight and focus on the potential constraints industry might place on Rothamsted's ability to continue to operate in an independent and ethical manner. However, participants also recognised that these principles could, to some extent, constrain Rothamsted's ability to attract and work effectively with industry partners. Participants developed an appreciation of Rothamsted's reasons for working with industry as the dialogue progressed, and were keen to ensure that the principles they proposed would not jeopardise its ability to do so. In particular, working with industry was seen as a significant aspect of Rothamsted's financial sustainability as an institute, because diversifying its funding sources makes it less vulnerable.

Therefore, alongside the discussions focussed on prioritising Rothamsted's ability to make independent and ethical decisions with integrity, participants also talked about the importance of ensuring Rothamsted could continue to work with industry so as to be financially sustainable and increase the impact of its research. This difference in approach was described by one group at the collaborative workshop as principles that are “*idealistic*” and those that are “*pragmatic*” in nature.

This difference in emphasis was most pronounced between the two public workshops. In Exeter, principles tended to be more idealistic, with a particularly strong focus on humanitarian use of research, for example. In Harpenden, the attention to Rothamsted's sustainability was more prominent. This could be due to Rothamsted's status as a significant local employer in Harpenden, or because the initial plenary discussions at this workshop focussed on Rothamsted's funding situation more so than on the benefits of working with industry.

Although these were not always viewed as conflicting factors, there was certainly a tension between the two issues. This tension led to three different standpoints. The first standpoint prioritised the more “*idealistic*” principles by ensuring they are safeguarded when working with industry. The second was a “*pragmatic*” standpoint that favoured a compromise approach, whereby practical measures were suggested in order to achieve a balance between working within certain moral or ethical boundaries and meeting the requirements of industry. Thirdly, some felt the two could be resolved by Rothamsted

Principles relating to Rothamsted's sustainability from public workshops

Rothamsted (specialised negotiator) should have a clear valuation of their value added to industry and not undersell their services (Rothamsted undervalues itself 'step-up'). Therefore gain substantial benefit

Rothamsted's benefit needs to be proportional not flat fee

Be a hard negotiator at the contract stage and when agreeing profits

Contracts with firms need to be thorough and clear

applying the principles at a strategic level rather than on a case-by-case basis. For example, participants suggested that Rothamsted could prioritise making profit and gaining skills on some projects in order to have the resources to prioritise working for the public good in other areas of Rothamsted's research.

4.6.1 Safeguarding 'idealistic' principles

Some participants saw Rothamsted's independence and integrity, its ability to provide open access to results, its transparency and its ability to work for the public good as key selling points that should be safeguarded. Participants argued that Rothamsted offers industry partners a unique source of independent expertise, knowledge and skills. They felt that this should give the institute confidence in its value to industry, and that it should not allow industry partners to *"take them for a ride"*.

Further, some felt that by safeguarding these values, Rothamsted would be in a stronger position to attract more industry partners. This view was strengthened following stakeholder feedback emphasising the significant value that industry places on Rothamsted's independence, as well as stakeholder encouragement that Rothamsted should establish itself as *"partner of choice"*.

Some participants considered it particularly important for Rothamsted to stand by these ideals during the contract negotiation stage and not compromise for the sake of one particular project, because the benefits of remaining independent, transparent and working for the public good were so great.

4.6.2 Compromising at a project level

For others, realistic guiding principles for Rothamsted's work with industry meant compromising some of the other principles outlined in this chapter. For instance, there was uncertainty about whether it would be realistic to negotiate a partnership agreement whereby Rothamsted researchers could maintain their freedom to publish research findings immediately and use the results of research to develop other projects. Therefore, the exclusivity period described in the 'Open access to results' section was suggested as a pragmatic compromise that retains Rothamsted ethos of open access to results, while still being able to work effectively with industry. This arose from the identification of intellectual property tensions between the need to publish research and the desire for a private company to have exclusive rights in order to obtain a patent.

These participants felt that flexible contract negotiation was crucial ensure a balance between pragmatism and idealism.

"Need to alleviate tension between looking after the human good / humanitarian purpose and the potential impact on business progress" (Collaborative workshop discussion)

4.6.3 Taking a strategic approach

For others, compromise was considered important at a strategic level rather than a project level. Participants referred to the portfolio of research carried out by Rothamsted

Principles relating to Rothamsted's sustainability from stakeholder workshop

More professionalised contracting

and noted that some projects would be of greater benefit to society than others. Furthermore, participants recognised that often projects which would be of the greatest societal benefit might not receive a great deal of industry funding, and for Rothamsted to be able to work on these projects they must secure enough funding elsewhere.

As a result there was support for Rothamsted placing more emphasis on negotiating at the contract stage for a greater share of profits from the research, where possible. As such, the recommendation that Rothamsted should adopt a “tough” or “hard-nosed” negotiating position was popular.

Principles relating to Rothamsted’s sustainability from collaborative workshop

RRes should only agree to clear and thorough contracts which take account of potential risks (contracts should be signed in good faith)

“Be a hard negotiator at the contract stage and when agreeing profits” (Exeter public workshop output)

“[Receiving] 1% [of industry profit] is a shame - at least 10% or it’s a no go” (Exeter public workshop output)

Hard-nosed contract negotiation

They were also anxious to ensure that Rothamsted doesn’t undervalue its services when making partnership agreements. They felt that contracts should always reflect a high valuation of Rothamsted’s services that does not undersell the institute for short-term gains.

RRes should partner from a strong position and value its services well

“Rothamsted offer so much they should value themselves higher – 170 years knowledge, selling services needs to be much bigger” (Harpenden public workshop Discussion)

“Rothamsted should have a clear valuation of their value added to industry and not undersell their services.

- RRes should be courageous! Challenge companies

- Must know their own value – and future value of research”

(Harpenden public workshop output)

Should not undervalue or undersell themselves or their expertise

Where profits arise, there should be a realistic sharing of the profits

At the final collaborative workshop, four out of the five small groups included a draft principle on the subject of robust contract negotiation or placing a high valuation on Rothamsted’s services.

“Should not undervalue or undersell themselves or their expertise” (Collaborative workshop output)

Despite the complexities and caveats identified by participants throughout the dialogue, there was a sense that robust contract negotiation, the identification of pragmatic compromise solutions, and the adherence to a final set of guiding principles informed by the public dialogue would be effective measures to guide Rothamsted’s relationship with industry. They felt that this approach will enable Rothamsted achieve the benefits of working with industry whilst also ensuring that its core mission and values, and its status as an independent, charitable, and publicly-funded research institute are not compromised.

Chapter 5 Reflections on the dialogue process

This section reflects upon the dialogue process as a whole to identify particular areas of success and areas of learning for any similar processes in future. There are four areas we reflect on below:

- Project timescale
- Recruitment
- Process design
- Information provided

A full independent evaluation of the dialogue process was commissioned separately by Rothamsted Research. The report from this independent evaluation will include more detailed reflection on dialogue process, including those aspects discussed below.

5.1 Project timescale

The inception meeting for this project was at the start of December and the first round of fieldwork took place on 25 January. The Christmas break meant that two weeks of this were essentially lost and much of the planning work for the fieldwork was only really able to begin in earnest in early January. One impact of this may have been the recruitment problems that we experienced for the stakeholder elements of the dialogue. Although the number of participants attending the stakeholder workshop was 24, just one short of the target of 25, the range of perspectives was not as wide as it could have been. Most noticeably there were no non-governmental organisations (NGOs) present at the workshop. This was despite inviting 60 stakeholders in total, as well as asking invitees to pass the invitation to their colleagues and wider contacts.

The collaborative workshop was attended by eight stakeholders of whom only three were not from Rothamsted, despite all 24 participants from the stakeholder workshop being invited to attend. As well as the tight timescale, a difficulty with the collaborative workshop stakeholder attendance is likely to have been due to the event being held on a Saturday. This day was chosen because from our experience it is the best day of the week to bring together a diverse group of the public. For future collaborative workshops we still think that a Saturday is the preferred day if the workshop is longer than 3 hours in length, but to ensure more attendees the lead-in period should be longer in order to provide more notice to stakeholders and to allow time to develop a longer list of stakeholder invitees.

One further consideration regarding the timescale is that the Oversight Group had a valuable role in identifying potential stakeholder participants. While the first Oversight Group meeting was held in December, the second was on 15 January which was only two weeks before the stakeholder workshop. If this had been held the previous week that may have been helpful in boosting attendance.

5.2 Recruitment

One area that stands out as an area of success was the quality of the participants recruited for the public workshops. The participants were from a diverse range of backgrounds and were, on the whole, a particularly engaged and participative group. Furthermore, the public participants did not come with any preconceptions or prior knowledge of the relationship between Rothamsted Research and industry so they were able to view how the relationship should work in theory, rather than being encumbered by having been involved in Rothamsted's work in any way.

However, the recruitment of participants for this project faced a number of challenges. All participants should have been recruited on-street, but several at the Harpenden workshop were recruited from a fieldwork agency database due to short-notice personnel issues at the fieldwork agency. A risk of recruiting from a panel is that those participants could have taken part in public dialogue events before and might therefore, be different in some way to most members of the public. However all participants, however recruited, fulfilled all the quota sample requirements. None of them had attended a public dialogue event before; neither had they attended any market research event in the past 12 months. So, from the screening questionnaire (see Appendix 6) there would be no reason to exclude them. However, there still remains the wider question of whether being on a panel means they are, in some way, different to other members of the public. One difference could be that they are more familiar with the format of the workshops that were held and therefore would be more comfortable in voicing their opinions.

Another recruitment concern was whether there was a diverse range of public participants at the collaborative workshop. Given that attendance at the collaborative workshop was self-selecting, there was a risk that this process would introduce an imbalance. From the details of the participants given in the Methodology chapter we are confident that there was a good range of public participants at the collaborative workshop.

A concern was raised in the previous section about the breadth of stakeholder input at the stakeholder and collaborative workshops. From the interactions we observed at the collaborative workshop, members of the public benefitted from being able to discuss their views with stakeholders. If there had been a larger number of stakeholders there would have been more of these beneficial interactions. NGO representation at the meetings would also have added another perspective to the stakeholders' set of guiding principles and to the stakeholder feedback shared with public participants in the collaborative workshop. The impact of the absence of this perspective was mitigated to some extent by incorporating written input from two NGO representatives into the stakeholder feedback presented to participants at the collaborative workshop. Furthermore, interviewing representatives from two NGOs during the scoping stage enabled their perspectives to be taken into account during the development of the case study materials.

5.3 Process design

During the stakeholder workshop, when participants were asked to comment on the public's first iteration of a set of guiding principles, there were a few comments that they were “*naïve*” and “*confused*”. In our view this lack of familiarity with the issues was unsurprising and perhaps beneficial, as it was an indication that participants were able to approach the issues with an open mind. The involvement of stakeholders at a later stage in the process brought a reality perspective to the discussions, which enabled the public participants to develop their understanding and recommendations in a way that was applicable to the reality of Rothamsted's operations. At the collaborative workshop there were good quality discussions between members of the public and stakeholders, and we see this as indicative of both having gained an understanding of each other's perspectives and seeing how they could work together effectively to further develop the principles. In this sense we feel that the process design was effective in meeting its objectives.

However, there are some minor adjustments that could have been made to the stakeholder workshop stage. Due to their prior involvement with Rothamsted Research, stakeholder participants were not always able to take a step back from their system perspective, to reflect on the wider issues raised by the public participants. As such, the stakeholder workshop would have benefited from a clearer briefing and introduction, particularly to ensure their understanding that the public guidelines were part of a wider discussion about how Rothamsted should work with industry and were not binding. Furthermore, the workshop introduction could have clarified that the role of the stakeholders in the workshop was to comment on a first iteration of the guidelines, and that this first iteration would not be finely crafted and would have been produced by participants with little understanding of the complexities, processes and interdependencies that exist or of what it is like to be a stakeholder.

One further observation about the process design was that it was flexible to meet the shift in the overall aims of the dialogue. Originally one of the main aims of the dialogue was to develop a single set of guiding principles. It soon became very evident that not only would this be very difficult to achieve, but that it might not also be the most beneficial output to work towards. With this in mind a revised main aim was to gain more of an understanding of the issues that really matter to the public about Rothamsted's relationships with industry, where they have concerns and the type of things which Rothamsted needs to bear in mind to maintain the public's confidence.

5.4 Information provided

One of the challenges for a deliberative dialogue process is the introduction of information to aid participants' discussions. They need to be provided with information to help develop their understanding of the issues so that they can give informed rather than 'top of mind' options.

A frequent concern for deliberative processes is that the information used can bias the discussions. It is important that the information is thorough and balanced so that participants are able to see the full range of views on the issues they are being asked to discuss and any differing perspectives. In the case of this dialogue, three case studies

were used as a source of information and as a basis for discussions at all three workshops. The purpose of these case studies was to bring to life the typical tensions that arise for Rothamsted staff when working with industry. As such, they needed to be sufficiently detailed to illustrate these tensions. The origin of the case studies was the scoping stage of the project – the web-based literature review and the stakeholder interviews outlined in the Methodology. Once the case studies had been drafted they were discussed with the Oversight Group and then further refined.

We are confident that the case studies served their purpose well. They highlighted the typical tensions that arise in Rothamsted's relations with industry but did not lead participants towards what guiding principles might be needed in response. During the planning stages of the dialogue and in discussions with the Oversight Group we discussed how we should introduce the concept of guiding principles. It was decided that we should develop a case study which helped illustrate what guiding principles are, but it should not be one that is too similar to what might be required by Rothamsted (see NHS case study in Appendix 5). We were keen that participants were tasked with developing their own principles and not cherry picking from existing ones.

We chose the NHS scenario to help us explain the concept of guidelines largely because it would be very familiar to participants. The use of this scenario may have had some unintended consequences in that it may have prompted some discussions and concerns about privatisation, and perceived tensions between the quality of patient care and the profit motivations of a private clinic. The scenario may therefore have had an influence on how the tensions involved in Rothamsted's work with industry were framed by participants.

Running the first two public workshops in parallel had the unavoidable consequence that different Rothamsted staff attended each meeting. This introduced the possibility that different background information, explanations and answers to questions may have been available to participants throughout the process. This was mitigated to some extent by identical slides being used for the two Rothamsted presentations. However, if more time had been available for the project, holding the two workshops on separate Saturdays with the same presenter would have ensured greater consistency. It should also be noted that an objective of the dialogue was to support the development of a culture of listening and engaging in dialogue with Rothamsted and that having only a small pool of Rothamsted staff attending the workshops, whilst increasing consistency, would have been detrimental to this objective.

A key source of information was of course the other participants sitting round the table – both public and stakeholders. Public participants were given the opportunity to challenge and seek clarification on the draft principles put together at the other public workshop, and on the feedback provided by stakeholders. This challenge and clarification process was useful for unpacking key definitions that underpinned people's summaries, and if more time had been available at the collaborative workshop then further plenary discussion would have provided more opportunities to do this.

5.5 Learning for the future

- The short timescale available for the dialogue impacted on some aspects of the delivery, particularly stakeholder recruitment. A longer lead-in period would have increased the possibility of a wide range of stakeholders being able to participate, particularly in the Saturday workshop.
- The public participants' lack of familiarity with Rothamsted and its relationship with industry partners enabled them to bring a unique and useful perspective to the discussions.
- The process benefited from allowing public participants the time to develop their understanding about Rothamsted Research and its relationship with industry before bringing them together with stakeholder participants.
- Stakeholder input enabled public participants to develop their understanding of the practicalities of Rothamsted's work with industry and thus the implications of their recommendations.
- The range of perspectives and representation on the Oversight Group was extremely valuable for the development of materials and the provision of stakeholder contacts during the scoping stage.

Chapter 6 Conclusions

In this final chapter we summarise the main findings from the dialogue that relate to how Rothamsted Research should conduct its relationship with industry, and the extent to which the project objectives were met, before reflecting on the value of the dialogue.

6.1 Findings

The public dialogue process has provided Rothamsted Research with an understanding of the main issues of importance to public participants, to inform its work with industry.

Participants developed a strong appreciation for Rothamsted's work, as well as its status as an independent voice, a charitable organisation, and a publicly funded research institute. They supported and understood why Rothamsted wants to work more closely with industry and supported the idea of developing guiding principles for doing so. Prompted by the illustrative case studies, they readily identified the kinds of tensions that may arise in such collaborations, and throughout the dialogue process they gradually drafted and refined principles that they felt to be important for Rothamsted to adhere to in order to navigate these tensions.

The findings were organised into five overarching thematic areas.

6.1.1 Working for the public good

Rothamsted's ability to continue to work for the 'public good' was of great importance to participants, and that there should be access to research for humanitarian usage was a very popular recommendation.

Participants perceived a tension between working with industry and working for the public good, despite their recognition that working with industry enables the research to be applied in order to have a beneficial practical impact.

They suggested that, as well as establishing a humanitarian usage clause in contracts, there should be robust reinvestment mechanisms to support Rothamsted's work, ethical partnering criteria, and thorough risk assessment to ensure that industry collaborations do not constrain Rothamsted's ability to work for the public good.

6.1.2 Independence and integrity

The ability for Rothamsted to maintain an independent voice and to make decisions with integrity, in line with their overall mission, was seen to be important.

Participants felt that working with industry could constrain Rothamsted's ability to act independently, as well as affect the public perception of its independence.

Some participants therefore suggested that Rothamsted should establish partnering criteria to safeguard their independence and the public perception of their independence, and to ensure they can clearly articulate the rationale for each industry collaboration. Diversifying its industry funding portfolio in order to avoid being dependent on a small number of large companies was a popular suggestion, as was conducting thorough risk assessment as to any potential impact on its independence or integrity.

6.1.3 Transparency and public involvement

As a publicly funded research institute, participants felt that transparency was very important and that there should be regular public involvement to inform decision-making.

Participants felt that working more closely with industry could affect public trust if people thought Rothamsted is not sharing all the information about the work being undertaken.

To avoid these potential negative effects, participants suggested a number of measures such as ways to involve and communicate with the public, being open to external scrutiny and evaluation, openly declaring any conflicts of interests, carrying out risk assessments that include consultation with all staff, and how to interact with the media.

6.1.4 Open access to results

The need for all research to eventually be in the public domain was seen to be very important, for Rothamsted as an institute, and for individual scientists, as well as for knowledge exchange with other research institutes, with charities, and with farmers who could benefit from the research.

Participants were concerned that industry might take too much control or ownership of intellectual property that could prevent Rothamsted from publishing its research, or from sharing the research with others.

They suggested establishing an exclusivity period for ownership of the research outputs as a pragmatic compromise between the needs of industry and Rothamsted. They also felt it was important that Rothamsted should be proactive about knowledge transfer.

6.1.5 Reconciling idealism and pragmatism

Many participants were keen to ensure that the principles they proposed would not jeopardise Rothamsted's ability to work effectively with industry. There were some differences in approach to this, described by one group at the collaborative workshop as principles that are "*idealistic*" and those that are "*pragmatic*" in nature.

The tension between these approaches led to three different standpoints. The first prioritised the more "*idealistic*" principles by ensuring they are safeguarded when working with industry. The second was a "*pragmatic*" standpoint that favoured a flexible compromise approach. The third favoured applying the principles at a more strategic level. In each of standpoint, the topic of effective contract negotiation was common, as well as ensuring Rothamsted places a high value on the service it offers to industry.

6.2 Achievements of the dialogue

There were four key objectives for the dialogue, and the extent to which they were met is summarised briefly below^{xxii}.

To engage in discussion with a diverse group of the publics and stakeholders on Rothamsted Research's work with industry

A diverse group of public participants as well as a variety of stakeholders took part in the dialogue. The public developed a high level of understanding about the issues surrounding academic-industrial collaboration and, at the collaborative workshop, co-produced a series of recommendations with stakeholders to guide Rothamsted's engagement with industry.

To develop a set of guiding principles on the basis of the public and stakeholder engagement for Rothamsted Research's work with industry

Participants at each workshop developed a set of principles to inform Rothamsted's work. However, this report also captures the processes and discussions through which these principles were arrived at, drawing out the five key themes of independence and integrity; openness and transparency; the public good; and the need to reconcile idealism and pragmatism. The report provides an analysis of participant opinion regarding the importance of these themes, the constraints placed by industry upon these, and mitigation options.

Support the development of a culture of listening and engaging in dialogue within Rothamsted Research

The dialogue involved Rothamsted researchers and staff at various stages - from process design to execution. This was primarily in order to support the development of participants' understanding of Rothamsted, but it also contributed to their own understanding of public opinion and engagement techniques.

Outputs disseminated to other public-funded research institutions

The next steps will be to disseminate this report to a range of audiences, including the dialogue participants, the wider public, and partner institutes and organisations. The aim is also for the findings to be used to inform Rothamsted's Knowledge Exchange and Commercialisation (KEC) Strategy and Policy.

6.3 Value of the dialogue process

Qualitative approaches such as public dialogue are not about identifying the prevalence or distribution of a phenomenon, or making claims about the whole population from researching a sample (as in quantitative research). Rather it is about attaining a better understanding of attitudes and opinions and why people hold them. Like any dialogue, this project involved a specific set of people – both public participants, stakeholder participants and the delivery team – in a particular discussion at a particular time.

The dialogue has demonstrated the value of bringing different perspectives to bear on what may initially appear to be a complex or technical subject area. When compared to the input from stakeholders and experts, public participants brought different, but equally valuable, views and insights, and were able to see the main issues and tensions from a wider perspective than those who are involved in Rothamsted's work on a regular basis.

Throughout the dialogue, public participants became more informed about Rothamsted Research and the context within which it operates, by discussing and reflecting on stakeholder input and the information and illustrative case studies presented to them. As a result, participants were able to articulate their thoughts and recommendations in a measured, realistic, and assertive way at the collaborative workshop where they worked with stakeholders to co-produce their final draft guidelines for Rothamsted.

The involvement of staff from different departments at Rothamsted Research as stakeholders had value in terms of supporting the dialogue process but also for their own understanding of the applicability of this kind of dialogue with members of the public for their future work.

The process enabled us to map the range and diversity of participants' views, the nature of the debates, and the ways in which views shifted in response to discussion, stimulus materials, and input from stakeholders and experts.

This report has presented these findings in detail in order to support the development of Rothamsted's Knowledge Exchange and Commercialisation (KEC) Strategy and Policy and to inform their future relationships with industry. There is also scope to share this report and the insights within it with a range of audiences, including the dialogue participants themselves, the wider public, and partner institutes and organisations, in order to contribute to knowledge sharing and potentially to trigger further public engagement.

Appendices

Appendix 1. Public workshops - summary

The following is a summary of the discussions in the two public workshops on 25th January. The scenario used in the first discussion was primarily illustrative, its purpose being to introduce and explore reactions to the use of guiding principles. The reactions to the three hypothetical Rothamsted case studies are covered in Appendix 4. Meanwhile, comments and suggestions recorded against each of the guiding principles are included in full for both of the workshops in the main body of the report. The summary here therefore focuses on the comments and questions raised in plenary sessions, with the aim of illustrating how participants' views and understanding developed through to the collaborative workshops.

Harpenden

Initial reactions to Rothamsted Research

Particularly in the first plenary session, a number of the comments and questions raised reflect participants' reactions to the work of Rothamsted research more generally. For example participants ask whether Rothamsted's work is focused only on the UK or whether it has a more global concern and if the organisation collaborates with other countries.

Other comments reflect interest in some of the technicalities of Rothamsted's work, for example, surprise was expressed at the length of experiments, with materials being archived for 170 years. It was suggested that Rothamsted should charge for use of such materials, given that they amount to 14 tonnes per year.

Wider context of agricultural research

Participants also engaged with some of the wider issues around the research carried out by Rothamsted, such as soil capacity and land use.

In relation to the figure cited that 40% of land is used for agricultural production for example, it was questioned whether the solution was to bring more land into production or to increase yield. Similarly it was asked where the line could be drawn in terms of how much land can be used for agriculture, as well as whether soil was being overused or depleted.

Research ethics and funding

There were also a number of questions relating to Rothamsted's current sources of funding. For example, it was asked whether they receive funding from charities and why they were not able to maximise this funding. It was also asked whether they receive money from other countries including China and whether research would be able to continue in the same way if private funding was not secured.

Some respondents expressed reservation about the greater involvement of industry in this type of research through increased funding with one participant suggesting this was not consistent with the organisation's humanitarian aims around reducing food scarcity. Another questioned how the principles would be applied when accepting funding, asking if Rothamsted would 'pick and choose' between companies or projects, based on moral or ethical criteria.

Intellectual property

The second plenary followed a case study of a PhD student, outlined to illustrate issues surrounding intellectual property and private purchasing of research outputs. As such, in this session in particular there were a number of questions about the rights to research and publication. For example it was questioned whether and how funding arrangements would affect publication of research. One respondent expressed concern that under the terms and conditions of the deal being struck, a private company would own all rights to intellectual property, in other words that Rothamsted was 'giving everything away'. This negatively affected the PhD student who relied on much of the information being purchased to carry out her research. It was questioned whether this is normal in such contracts and what Rothamsted would gain from such an arrangement.

More generally one participant asked whether Rothamsted get the right to the research of the student, while another said they would like to know where publications are, noting that scientific journals are not accessible.

Output from Harpenden public workshop: Draft guiding principles

There was uncertainty as to the purpose or rationale for developing guiding principles, with some participants asking for clarity on this. As mentioned above, it was also questioned how these would be applied. Each small group was asked to devise a draft set of guiding principles and note them on post-it notes. At the end of the workshop these draft principles were summarised by facilitators and participants were asked to place five stickers next to the principles they agreed most strongly with. These summarised principles and the post-it note comments relating to each of them are listed below, along with the associated number of sticky dots:

Rothamsted (specialised negotiator) should have a clear valuation of their value added to industry and not undersell their services (Rothamsted undervalues itself 'step-up'). Therefore gain substantial benefit - 20 dots

- RRes should be courageous! Challenge companies
- Must know their own value – and future value of research

If public money leads to private profit, some profits should return to public - 18 dots

- Duty to the public as Government put money in. There needs to be some financial benefit to the public
- % return in profits to Government
- If profit from public data – profit must help public in some way

Any work undertaken with industry must be subject to a 'humanitarian usage clause' - 18 dots

- Company must have humanitarian usage clause
- Duty of care – humanitarian reason for knowledge being shared
- Companies cannot withhold intellectual property at detriment of public good
- If there is a humanitarian benefit should Government take over the funding

Any contractual patent period will have an appropriate time limit - 15 dots

- Must be time limited (but limit will vary project to project)
- Cap on exclusivity period. Then it becomes public
- Patent should not stop Rothamsted building on the knowledge of that research

Before any contract is agreed all possible implications will be assessed (across whole organisation, in long and short term) - 11 dots

- Test contracts internally to look for problems: when agreeing contract terms with industry Rothamsted must take on board views of people on ground

RRes will be open and transparent about who is benefitting from their research – 9 dots

- RRes should be open about who they're working with, on what and to what aim
- Transparency including who is benefitting from Rothamsted's research? Must be some ... benefits. How taxpayer will benefit
- RRes should be driven by being open, honest and true (not by potential risks to public reputation as this will follow on anyway)

RRes will only work with companies that meet specific ethical criteria - 6 dots

- Partner assessment needs to be robust: choose a company on basis of criteria:
 - Humanitarian research potential
 - Short and long term research benefit
 - Financial benefit to Rothamsted
- Fully assess integrity of any potential partners
- Industry / company ethics should be investigated before any contracts
- Definition of 'public good' needs to be clear

Rothamsted's benefit needs to be proportional not flat fee - 6 dots

- RRes's stake as a % (shareholder?) of future project. Not flat fee
- % turnover not profits can be manipulated

Any potential conflict of interests will be declared - 5 dots

- Potential conflict of interests should be declared
- Make conflict of interests known in the Press release

Contracts with firms need to be thorough and clear - 4 dots

- Clear contractual agreements from outset
- RRes should ensure clarity in T&Cs of contractual agreements and no grey areas
- Agree terms of usage of other equipment in advance of project

Money made from products developed using public information (based on previous public research) should generate some public re-investment - 3 dots

- T&Cs of contracts need to allow for research to be used for public good

Where Rothamsted science is being challenged but is subject to commercial confidentiality an independent body should have access to findings to evaluate - 2 dots

- Independent oversight of science when there are possible problems
- Is there an overseeing body to validate the independence, quality, ethics etc. of Rothamsted Research (or in the company)
- Intermediaries included in the research as it goes along – transparency
- Total transparency of research and how they reached that conclusion – public access → overseeing body

Exeter

Initial reactions to Rothamsted Research

As in Harpenden, participants were interested in the focus and extent and of Rothamsted's work, for example asking if the organisation does any work in Spain and if they work on issues other than wheat.

However there was more interest in the different areas of policy covered by their research, with participants asking if Rothamsted are involved in organic farming, plant genetics and asking if particular issues had been investigated (see below, Wider context). More generally, Rothamsted were asked what the major benefits to society would be from the work they are currently doing.

Wider context of agricultural research

As in the other public workshop, some of the questions about Rothamsted's work reflected interest in issues around agriculture and environmental issues more generally. For example it was asked if Rothamsted had done research into using pests to control other pests and if they looked at the long term effects of agricultural chemicals.

Participants also asked if wildlife was disappearing because of pesticides, why the government appeared to be paying farmers not to grow and if there are any chemicals that could change the climate.

Research ethics and funding

As in Harpenden there were some reservations about encouraging private funding in the research. For example one participant felt there was a need to make sure that funding would not allow companies to develop a competitive product and 'sit on it' (restrict it's availability) for their own benefit. There were also some questions about the application of the principles. For example it was asked how Rothamsted weigh up various factors, including the benefit to society, and what was deemed important in terms of outputs.

Intellectual property

As in the Harpenden workshop, the case study of a PhD student discussed in the second plenary provoked a number of comments and questions about intellectual property and publication rights. As in the first workshop, there was some unease about this scenario, with one comment that it seemed the company was ultimately "the boss" in

such arrangements. By contrast, another participant suggested Rothamsted should just take a commercial view as to what could be gained from the research. In the first plenary it was asked if Rothamsted could file patents and derive some income from this.

Other questions included whether Rothamsted Research themselves offered sponsorships for PhD, and if so would they licence the results and how would it be split with the student. Similarly, one participant wondered who would own the rights in the case of a PhD student doing all the research and developing a product themselves. Participants were also interested to know who decided whether, how and when research would be published in such cases and if there was a body to appeal to in case of a dispute over rights.

Output from Exeter public workshop: Draft guiding principles

As at Harpenden, each small group was asked to devise a draft set of guiding principles and note them on post-it notes. At the end of the workshop these draft principles were summarised by facilitators and participants were asked to place five stickers next to the principles they agreed most strongly with. These summarised principles and the post-it note comments relating to each of them are listed below, along with the associated number of sticky dots:

Humanitarian access to results – if it is going to benefit society – 26 dots

- Information/medication freely available to 3rd world countries
- Research and know how available to all for production of medication for relief/cure of infection etc.
- Rothamsted must always maintain importance of public interest
- Working for public good
- Stay green, protect environment
- Last point (computer input). This needs to be thoughts about at the outset. Does the commercial benefit justify obtaining other modelling system.
- Not fund company profits from any deal
- Must have public food
- Humanitarian principle
- Does them chemical harm environment
- The greater good vs monetary gains for private companies
- Peoples safety is important
- Categorisation system whereby certain research projects categorised as 'public benefit' or 'Greater good' projects are funded public
- Environmental issues are important

People's safety is important – 20 dots

- Consider environmental impact

Only work with companies which benefit society – 17 dots

- Which agro-chemical companies?
- Check up company
- Choose company which will do social benefits

Introduce 'veto power' if results are not used for public benefit – 15 dots

- Rothamsted should be able to reserve the right to recall and control any intellectual property born as a result of the research
- Veto power for limited period
- Detach themselves from any debate and sever their links

Allow knowledge transfer across sectors – 11 dots

- Knowledge transfer (agricultural skills to medical/health benefit)
- Is it right to take work that is not in your field

Make information available (open access to results and methods) – 11 dots

- With caveat: 'But allow period for obtaining patents – 1 dot
- Information free available to everyone
- Access to information
- Open to public
- Duty to publish – not negotiable
- Must insure that any results of public interest are able to be used and shared effectively
 - Scientists know they need to publish work
- Unable to publish work or use it to help
 - Only for the money if you can't use the findings
 - If results have a positive humanitarian effect then they should be able to be used
- A time limit (whatever is deemed reasonable) before being able to share results

Transparency (not included in prioritisation exercise)

- Evidence released explain to lay people
- WHA needs to be publish
- Have to be careful on airtime, as what is said could harm the reputation of the company
- Be open and transparent. Don't hide it.
- Open and honest with other public research institutes
- Must be transparent
- All of Rothamsted's projects must always be of highest level of transparency to maintain ongoing reputation.
- Capable P.R. department to explain the research in an 'airtime' situation.
- - Must have a right to publish results of positive, - Freedom to follow on with more research

Get public input into decision making – 9 dots

- Collective thinking
 - Everyone involved in decision making
- Public involved in decision making process
- Taxpayers have a vote on where money is spent

Be a hard negotiator at the contract stage and when agreeing profits – 5 dots

- Resilient – keep standing up for principles/keep publishing
- Rothamsted need more hardcore aggression with companies, more say so but still be fair
- Rothamsted doesn't have a lot of competition but it has some
- 1% is a shame at least 10% or it's a no go

- Handle on what 1% may represent
- Reasonable to wait for a patent – presumably a matter of months. Not only reasonable but sensible as Rothamsted ought to profit financially from its input where reasonable
- Company should address environmental issues - include an “emergency clause”
- Rothamsted have more authority over dictations than those funding for profit have
- Not being dictated to by another company
- Risk assessment
- Written in contract for revoking license
- Resourceful – to get the contract the way Rothamsted research want it
- Get a tight contract straight before you begin

Stick to charity guidelines – 4 dots

- Comply with charity status
- Research within charity guidelines (no special treatment)
- Ground rule framework which all parties must adhere to.
- Articles of association
 - Stick to what the organisation set up
- Independent review of Rothamsted’s methods – 2 dots

Ensure independence and integrity (not included in prioritisation exercise)

- Independent company checks company and product
- Independent scrutiny of issues arising from collaboration between ‘Roth’ and a privately funded company
- Scientific research not compromised by link to the agro-chemical company. This needs to be easily demonstrated and explained. Can there be other causes?
- Question of independence
 - Proof of not of self interest
 - Transparency
 - Ongoing reputation
- Integrity of the institution must remain intact in the event of debate in the public domain
- Integrity
 - regarding relationships with partners
- Not skewing finding
 - Objectivity
 - Maintain their trustworthiness
 - Must be independent at all times

Other/general post-it comments

- Important not to compromise the actual research and be mindful of any negative aspects
- Code of practice and QA
- Research methods peer review
- Code of practice, - Peer review
- - Question of conflict of interest, -Try to do a joint venture
- Not publish if not benefits could grow out of time
- By granting no rights to other parties, they don’t allow for further research

- Respect
- Keep it simple stupid
- Would the work be stand alone or with other research
- Publication rights
 - Reputation
 - Transparency
 - Ethics
- All the same problems with all questions

Comparing the two public workshops

It can be seen from the summary above that similar themes emerged in the plenary questions and comments across the two public workshops in Harpenden and Exeter, although with a slightly different emphasis on some areas.

The same is true of the comments on the draft principles. A number of commonalities can be seen in these comments:

- Both valued highly the importance of incorporating a humanitarian usage clause in all contracts, and that consideration of the public good should underpin all partnering decisions.
- Both suggested that a partner company's ethical background should be a key factor to be taken into account
- The importance of transparency and openness in the reasons for undertaking research, the drafting of contracts and in the research process was highlighted.

There were also some differences in emphasis between the two workshops. For example, participants in Harpenden focussed on the return of financial benefits to the public sector, while those in Exeter prioritised the notion that Rothamsted research should serve the public interest in a wider sense.

There were also some different ideas raised by both sets of participants. For example in Exeter the importance of enhancing knowledge transfer and making information openly available to the public was highlighted. In Harpenden meanwhile it was suggested that an independent authority could be set up in order to establish the viability of controversial scientific evidence.

Appendix 2. Stakeholder workshop - summary

The Stakeholder workshops on 29th January followed a largely similar structure to the preceding public workshops, discussing a number of case studies between plenary sessions before a more focused discussion of the guiding principles. However, stakeholders were also asked to comment on the principles developed by participants in the two public workshops. These are summarised below in addition to the principles suggested by stakeholders. Again the discussion of the case studies is summarised in Appendix 4.

Plenary comments

Comments in the first plenary following the presentation reflected a very different focus to those in the public workshop. Perhaps unsurprisingly they tended to be more technical in nature and less concerned with establishing the nature of Rothamsted's work. For example stakeholders suggested that certain aspects of the company's work should have been better explained or emphasised more in the presentation or queried specific details mentioned. There were a number of questions seeking clarification on the amount of funding sought from industry- for example the proportion of total funding envisaged and whether this was achievable (how much funding was thought to be available), with one participant asking if the principles would apply to all funding, even where a mixture of public and private funds were involved. There were also a number of questions about Contract Research Organisations (CROs) - for example querying the definition and the scale of these.

Stakeholder feedback on public principles

Rothamsted Research should work for the public good

Stakeholders agreed with this overall principle but felt it needs to be more specific, and should refer to Rothamsted's mission statement rather than "public good" – it was also asked to explain what is meant by public good.

Rothamsted Research should only work with companies that benefit society / meet specific ethical criteria

Stakeholders felt this could be combined with the above principle and noted that ethical criteria would need to be defined also benefiting society should be defined what about the economic benefit – these were some important comments

Rothamsted Research should ensure appropriate access to results and information

Stakeholders agreed with this principle, but noted a difficulty in defining "appropriate"; that there can't be a single set time limit; and that a rationale should be included e.g. because it's important for the next generation of scientists to have access to results.

Rothamsted Research should be open and transparent

Stakeholders were in general agreement, and noted that Rothamsted already declares their funders, so this is in line with their approach. However there was also a caution that industry would not want commercially sensitive information to be made public.

Rothamsted Research should get public input into decision making

Stakeholders felt this was not practical, highlighting the role of the board of trustees in this regard, but acknowledging that more interaction with the public would be useful; this public dialogue is an example of this.

Rothamsted Research should negotiate well at the contract stage

There was agreement from stakeholders but also a note that this may be an operational issue rather than a guiding principle.

Rothamsted Research should only agree to clear and thorough contracts which take account of all potential risks of a project

Stakeholders suggested this could be combined with the principle above, but there was also a note that this can be difficult to achieve in practice.

The public will receive some profit from research, where appropriate

Stakeholders suggested this could be re-worded, to focus on furthering the objectives of Rothamsted (which in turn benefits the public) - as by re-investing the profit into Rothamsted, the public benefits as the government will have to provide less public money for research. Rothamsted does not have shareholders that make money from its operations all profits are re-invested to research.

Rothamsted Research should be consistent in how it engages with different partners

There was mixed stakeholder feedback, with some saying this is important and already happens, and others saying it is not practical and would be restrictive for Rothamsted.

Rothamsted Research should be open to knowledge transfer across sectors

Stakeholders were in general agreement. Suggestions included replacing “open to” with “encourage”, focussing on transferring *research skills* across sectors, and a note that Rothamsted should be proactive (not reactive) in transferring knowledge.

Rothamsted Research’s methods and results will be subject to independent review (particularly for controversial research)

Some stakeholders felt this is already covered in Rothamsted’s charter and that it is not clear how this relates to working with industry specifically.

Stakeholder principles

All data will need to be made public at some point

- Need to balance when - too early and results might not be robust, earlier shows independence
- IP censorship: need to negotiate humanitarian access
- Deal with the science and don't get involved in marketing

Keep all parties informed of commercial development (transparency)**More professionalised contracting**

- Define what commercial terms might look like
- Need for thorough preparation, consider potential exit strategy

Stay true to original Rothamsted mission statement versus taking up opportunities for broadening work for public good

- Must not conflict with charitable trust status
- Need to consider reputation of the institute

Only comment on independently verified research versus be open about defending your research

- Need to have an industry-wide discussion before commenting in the media
- Where RRes has been involved directly they shouldn't offer to comment
- Studies and data should be independently assessed

Consider how working industry may affect research career (not being able to publish)

- Any patents should be time limited and must not prevent publication

Think of integrity, credibility and public trust. Safeguard independence and quality of science

- Need

Comparison of public and stakeholder principles

A number of points of agreement can be identified between the two sets of principles, although in some cases those suggested by stakeholders refine or qualify those of the public:

- Both sets of participants underlined the importance of **accessibility** of Rothamsted's data and research, though stakeholders note that in terms of when data should be available this may depend on the research in question
- The need for **transparency** appears in both sets of principles, with stakeholders specifying what this means in practice
- The importance of contracting is highlighted by both. Again stakeholders specify what this might involve
- **Collaboration** is another common theme, although stakeholders present this as a trade-off with the need to remain true to the organisation's original mission statement
- Similarly, stakeholders are more reserved in their support for **independent verification or review**, noting a number of considerations involved with this.

Meanwhile a number of the principles suggested by the public are not reflected in the stakeholder suggestions. In the case of those such as the need for public input in decision making, these were deemed impractical. Some of these were also thought unnecessary in that they reflected current practice. Finally, the stakeholder principles include two additional points not covered by the public: consideration of potential impact on researchers and the need to maintain integrity, independence and public trust.

Appendix 3. Collaborative workshop - summary

The final workshop involved a selection of participants from the public and stakeholder workshops. Participants reviewed the discussion and outputs of all three workshops and discussed the three case studies further before a final plenary session. As with the other workshops, the afternoon discussion around the case studies is summarised in Appendix 4. The outputs relating to the prioritisation of the draft guiding principles are also reviewed elsewhere in the relevant chapter.

Public workshops - similarities

Having reviewed the list of principles put forward in the two public workshops, participants were asked to identify similarities and differences between these. Within table groups the themes identified were often explored through further discussion.

Overall, one group noted that the two sets of principles were very similar, but that the stickers (indicating agreement with each) suggested different prioritisation. In some cases it can be seen that while the two groups agreed on the importance of a particular issues they had emphasised this in different ways.

Humanitarian usage

One of the table groups in this workshop suggested that the principle from Harpenden about humanitarian usage encapsulated a number of the principles in the Exeter set, which had just given more depth and detail to this principle.

On this topic there was some discussion within table groups about the definition of humanitarian usage and whether this was the same as 'benefiting society'. Two groups felt that this should imply a global scale (as opposed to simply benefiting the UK public).

Negotiating contracts

Both workshops highlighted the importance of 'being a hard negotiator' and standing up to companies perceived as being in a position of power, ensuring that Rothamsted secures a good deal in contracts.

A related point, more generally both the Harpenden and Exeter workshops underlined the background and reputation of Rothamsted Research, as well as the value of its research base, arguing that it should not 'undersell' itself.

Patents

Both groups identified patents to be an issue- a collaborative table group acknowledged that these might need to be time limited so industry gets the benefit (which is why they're investing) but not forever.

One table group decided that the priority was to ensure that industry couldn't take research and keep it secret because it wasn't profitable if it could be put to some use.

A stakeholder within this group emphasised that the patent process is quite complicated- you do have to keep something secret in order to patent it all, so the important thing is the time limits.

Public workshops - differences

Within the group discussion, participants also identified some differences in the outputs from the two workshops, often speculating as to why this was the case.

Financial and humanitarian imperatives

For example, the Harpenden workshop was to have a stronger focus on financial issues, while the Exeter workshop was seen as focusing more on humanitarian issues or human good. In one of the table groups it was suggested that this could have been because Harpenden is more affluent, alternatively these participants could have assumed that Rothamsted had already considered the humanitarian aspect.

Pragmatism and idealism

One of the table groups thought the principles decided in the Exeter workshop were more idealistic, with one participant noting that while they supported them they would be harder to implement. There was some discussion about pragmatism on this table, with some suggesting that if guidelines were impractical industry would walk away, while one participant felt this was not a problem- that the principles should be more idealistic and that this would ensure that Rothamsted would only work with industry partners that supported their values. Similarly another group noted a potential trade-off between the principles potentially being so rigid as to deter companies, and on the other hand not being effective.

Profit

Both groups felt that it was important to ensure that a proportion of any profit from funding arrangements was secured. Within this point there was slightly more emphasis in the Rothamsted workshop on public value- returning public money through such profits generated with the aid of public funds.

It was noted that Rothamsted Research has charitable status- something that not all participants had been aware of at this point. In light of this it was felt that as it was working in the public interest but not part of government, the money could be reinvested in Rothamsted. It was suggested that Rothamsted could seek advice from other charities in a similar position such as Cancer Research UK.

Transparency and access

While both groups felt that transparency and access to research were important, Exeter placed more of an emphasis on this being in a form in which it could be understood by a layperson. Within a table group in this workshop, some participants argued that having access to information wasn't useful unless it could be understood by non-scientists. It was also explained that this related to the way the media present scientific issues- the

group felt there was a need for Rothamsted to have the PR capacity to be able to stand up to negative coverage in the media and ensure that more positive stories were also covered.

This issue also overlapped with that of humanitarian usage, with participants arguing that if research is for the public good- or involves public money- then it should remain accessible, with concern that private funding may affect this. One participant questioned whether this could potentially conflict with patents, while a stakeholder expressed the reservation that completely open access could mean funding other countries' economies rather than our own.

Safety

It was noted in one group that safety was discussed in Exeter but not in Harpenden. They talked about chemicals which could be harmful and the dangers of industry involvement meaning information would be withheld.

A stakeholder explained that RRes don't really do this type of research- for example involving chemicals, it's more likely that they would do work which leads to this much further down the line. After discussion about how to ensure against such cases of future use of basic research which RRes might not be involved in, it was decided that the principle should be more about having the right- or the responsibility- to speak up if they did identify or learn of any potential harm. Similarly, within one group concern was expressed that Rothamsted could become involved in controversial areas such as GM. A stakeholder in this group noted that Rothamsted would only be doing research on the techniques (for example testing the safety of these), which was accepted although there concern remained that Rothamsted could be seen to be endorsing such technologies through their involvement.

Other comments from table discussions

Outside of the similarities and differences of the two groups, reviewing the outputs of the two public workshops opened further discussion of these issues and others not covered above.

For example some table groups explored the question of what type of private organisations Rothamsted would be seeking funding from, with a stakeholder clarifying that this did not necessarily mean 'big business' but a range of industry organisations at various scales including small enterprises. Within one group in particular there was some discussion about the purpose of guiding principles and the overall approach. Reflecting on a stakeholder's explanation, public participants felt there were clear opportunities for collaboration with industry and that the principles were important in shaping these.

There also was further discussion within a number of groups about the need to safeguard the independence of Rothamsted research as well as its ethical or humanitarian reputation. This included further discussion within all groups about how humanitarian usage should be defined and how this could be affected- for example the potential conflict with commercial sensitivity in some instances.

Issues surrounding contracts and patents were also discussed in further detail in relation to transparency- who would own and benefit from research and resulting technologies, the potential for a 'humanitarian usage clause' in contracts as well as the need to protect the rights of academics to publish.

Public responses to stakeholder feedback on public guiding principles

Participants then had the opportunity to review the outputs of the stakeholder workshop: comprising stakeholder comments on the principles from the public workshops and the principles put forward by stakeholders themselves.

Much of the detailed thematic discussion is covered elsewhere in this report so the focus here is on the overall reactions of the public and the exchange of opinions within table groups. These are listed under the heading of the relevant principle below.

Rothamsted Research should work for the public good

Responding to the feedback that 'public good' needed to be more specific, the group challenged stakeholders to put forward suggestions as to how this should be defined rather than throwing it back to the public. It was also noted that the concept of public good could change over time and so would need to be reviewed regularly.

Rothamsted Research should only work with companies that benefit society / meet specific ethical criteria

Two groups disagreed with the suggestion from stakeholders that this principle could be integrated with the need to work for the public good. A number of reasons were cited for this: that there is a distinction between a company and the work it is involved in and that the ethics of both needed to be established; that there is a difference between actively doing good (as in the first principle) and avoiding bad; that this principle would also help avoid negative media coverage from partnerships; and finally that it related to transparency.

Rothamsted Research should ensure appropriate access to results and information

There was agreement in one group of stakeholder feedback about the timescale in which work is published. Assuming that a delay clause in a contract rarely impacts on publication (because the publication process can often be lengthy in itself) then it is a good compromise solution.

Rothamsted Research should be open and transparent

In response to the feedback that this principle was in line with current practice, the group felt this principle was about more than just declaring funders, for example noting that the board of trustees does not currently have public representation. They also queried the term 'commercially sensitive' meant and who would decide what came under this

definition, suggesting there could be an independent body to decide this in case of a conflict. Another group argued that even if this is reflected in Rothamsted's current practice it should still be included in the principles to ensure it is not abandoned. Stakeholder noted that it could be difficult to say exactly what they are working on but perhaps this could be disclosed in a broader way.

Rothamsted Research should get public input into decision making

There were a lot of reactions to the stakeholder comments here. In more than one group it was agreed public input would not always be practical. However there was also an insistence that that some kind of public feedback and involvement should be encouraged if Rothamsted is to be working in the public interest. One group more clearly disagreed with the stakeholder feedback. While recognising the difficulties in implementing this, participants in one group felt it was wrong to make assumptions about what the public should and shouldn't be involved with. In another group a stakeholder considered that the public could be engaged on a broader level rather than on specifics, and it was agreed that better communication of the Rothamsted's activities could help underpin informal feedback and engagement in the future. Suggested mechanisms for such engagement from other groups included market research style surveys and a board of trustees.

Rothamsted Research should negotiate well at the contract stage

One group agreed with the addition to this principle suggested by stakeholders that 'Rothamsted shouldn't undervalue/undersell itself', while also noting that their demands should not be so high as to deter industry. While there was general agreement in another group about the need for effective contract negotiation to be considered, there continued to be disagreement as to whether this needed to be included in the principles or whether it was an operational issue.

Rothamsted Research should only agree to clear and thorough contracts which take account of all potential risks of a project

In relation to the feedback about the practicality of this principle, public participants in one group argued that while it may not always possible to identify all the risks associated with a project, that didn't mean that attempting to do so was not worthwhile. They further clarified what type of risks they felt Rothamsted should be considering.

The public will receive some profit from research, where appropriate

As mentioned above, following clarification of Rothamsted's charitable status more than one group accepted that profits would be reinvested, although in one case adding that there should be transparency about financial transactions. In another, members of the public reiterated their belief the need for money from government grants to be returned to the government, while a stakeholder argued that it should stay with Rothamsted to support future research in the same area. It was also argued that clawing back public money from projects in this way could affect the incentivisation for scientists.

Rothamsted Research should be consistent in how it engages with different partners

In one group there was sympathy with the stakeholder feedback that this may not always be possible, and some of the difficulties and considerations of this were discussed. However, some felt consistency was still important in order to maintain a level playing field in line with its commitment to openness and transparency and also to avoid comprising research ethics. In one group a stakeholder was asked if Rothamsted are asked to move outside of the agriculture sector with the response being that the organisation does not take contracts outside of its mission statement.

Rothamsted Research should be open to knowledge transfer across sectors

There was broad agreement from more than one group with the stakeholder feedback on this principle. After further discussion in one group it was suggested that was consistent with working for the public good.

Rothamsted Research's methods and results will be subject to independent review (particularly for controversial research)

In one group at least there was acceptance of stakeholder feedback on this principle, with members of the public saying they had been unaware that this was covered by existing structures.

Final plenary session

There were only two comments or questions raised by members of the public in the final plenary session. This is most likely to be due to the fact that representatives of Rothamsted research were on hand to answer questions arising within the table groups. To some extent this may also reflect the fact that, by this stage, participants had a better understanding of Rothamsted Research, the issues surrounding private funding and the purpose of guiding principles:

- How can RRes ensure that the public is actively involved in its work? In relation to this it was suggested that there was a need to have clear channels of communication with the public
- The public should be regarded as a separate entity or body which should be allowed to engage with RRes in an open and transparent way, but keep in mind that the public is not a decision-making authority

Output from collaborative workshop: Lists of principles

Participants, in small groups, developed draft sets of principles at tables over the course of the day. These outputs from each table are provided below.

Table 1

- RRes will always maintain on independent, unbiased internally agreed views
- 'humanitarian usage clause' – when appropriate

- RRes should work for the public good on the basis of ethical criteria (included in BBSRS) criteria)
 - Check companies' 'code of conduct'
- RRes should ensure appropriate access to results and information and good negotiation at the contract stage
- RRes should consider public views ((web page 'have your say')
- RRes should only agree to clear and thorough contracts which take account of potential risks (contracts should be signed in good faith)
- Public will receive benefit from research through money being re-invested in RRes
- RRes should be consistent in how it engages with different partners and engages with a wide range of partners
- RRes should encourage transferring research skills and knowledge across sectors
- RRes's methods and results will be subject to independent review e.g. independent audit, peer-review

Table 2

- Consider the impact on the career of individual scientists
 - Consider publication rights
- Hard-nosed contract negotiation
- Include a humanitarian usage clause where appropriate
- Where profits arise, there should be a realistic sharing of the profits (links to 2nd point above)
- Continue to be transparent about who its working with and broadly what its working on
 - Declare up front who it works with
- Don't be side-tracked from main mission
 - Even for lots of money
- Don't put too many resources on one project
- Work with a broad range of industry partners at any one time
- RRes needs to be able to communicate its message effectively in the media and to the public
- Proactive approach to knowledge transfer from RRes to research institutions, industry and end users
- Don't lose track of RRes's mission (that already exists)
- When deciding whether to work with a company consider all areas of work that the company is involved in

Table 3

- RRes to work for public good
 - Benefit global society
 - Government aims of food security, reduced CO2 (e.g. biofuels) and keep people healthy are a good guide to this
- RRes should be transparent and credible and trustworthy

- Need to maintain independent voice
- Plus need to communicate findings accessibly (to business and public)
- Need scrutiny (from various places), but not necessarily from public
- Be proactive about knowledge (salmon, who killed fish) transfer from projects
- Money generated can go back to RRes to be used for public good
- Contracts should ensure RRes industry and the public call all benefit symbiotically - remember the public
- Ok to work with all types of companies so long as the work contributes to public good and is in line with other principles - not all companies, reputation risks involved
- Data must be published at some point
 - With agreed time frame – possible guidelines

Table 4

- RRes should balance commercial interests and the 'public good' and if it's not clear the decision should be reported up
 - Including ethical criteria for partners
 - 'public good' can and should be reviewed periodically
- RRes should be open and transparent as an organisation
 - About its funders, commercial interest, profits, conflicts of interest
- RRes should be open and transparent about its research – publish all data
 - Within time limits
 - With local communities affected by research
 - Honest about pros and cons
 - By default if not used after a set time
- RRes should involve the public in its work
 - Seeking opportunities to do so actively and considering layman's terms etc.
- RRes should consider risks of collaboration projects, both research and commercial
 - Will it work?
 - Will it be commercial?
 - Could it be harmful in the short or long term
 - Does the contract mitigate these? With options
- RRes should partner from a strong position and value its services well
- RRes should reinvest its profits in work that conforms to these principles
- RRes should reserve the right to make research available to support humanitarian activities. Needs more definition e.g. crisis

Table 5

Initial areas of focus

- Profit – pros and cons of returning to RRes vs government but overall focus on public benefit

- Public involvement - especially important to contribute to influencing government policy (1 x star)
 - Use more innovative techniques to engage public
- Openness and transparency is important and delay clause is a good compromise
- Contacts – included as guiding principles or operational/process issue? But agreement on importance
- Ethics and morals in decision making
- Public good/humanitarian usage
 - Should be global perspective not just UK
- All research should eventually be in public domain

Final principles:

- Open and transparent communication should be built into the planning and implantation of the research at an early stage
- RRes should educate and actively involve the public to help inform decision-making
- Should not sign contracts giving company total control/veto (exclusive rights) unless all other alternatives have been explored
- RRes's sustainability (ability to continue) should be included in the concept of 'public good'
- Should not do anything that might affect its charitable status
- Should not undervalue or undersell themselves or their expertise

Output from collaborative workshop: Summarised and prioritised list of principles

The table below is one of the outputs from the collaborative workshop. Participants, in small groups, developed draft sets of principles at tables over the course of the day (see above). These were then brought together and the main themes from all tables were summarised in one list, which was then presented back to participants for challenge, clarification and a prioritisation exercise.

For the prioritisation exercise, participants were asked to indicate, using sticky stars, which principles they considered the most important. Participants were given 5 sticky stars and could stick as many of their 5 stars as they liked against each principle. The number of stars per principle is shown in the right hand column of the table.

Note: The list below is the output of a short theming session conducted by facilitators during the workshop's 20 minute afternoon break.

Principle		Number of stars
1	Reserve right to humanitarian access	25
2	Don't undervalue the expertise and skills (of Rothamsted Research)	15
3	Proactively share knowledge and skills	14
4	Involve the public actively to inform decisions	12
5	Have an ethical component to partnering decisions	11
6	Reinvest profits in Rothamsted Research	11
7	Make all research available (subject to time limits)	9
8	Be open to external scrutiny at all levels	9
9	Preserve independence as a scientific voice	9
10	Consider risks and negotiate hard at the contract stage	8
11	Consider the sustainability of the institute	5
12	Communicate effectively and early	5
13	Be open about who and how much	3
14	Consider scientists' careers	3
15	Keep a wide portfolio of partners and research topics within Rothamsted Research mission	3

Appendix 4. Summary of responses to case studies

Three case studies, designed specifically for this dialogue, were used in all workshops to illustrate the potential tensions arising from Rothamsted Research working with industry, and to prompt discussion about what principles could be put in place to navigate these tensions. The outputs from these discussions have been analysed and included in the main report.

To help provide some context for how these case studies were responded to within each workshop, a short summary of the main issues and principles raised by stakeholder and public participants following consideration of each case study is provided below.

Please see Appendix 5 for the full case study text as shown to the dialogue participants.

Case Study 1: Mosquito Repellent

In this scenario Rothamsted is approached by a pharmaceutical company interested in building upon the results of previous publicly funded Rothamsted research to develop a new mosquito repellent. The company offers Rothamsted a 1% share in global profits and demands exclusive ownership of all results, with veto rights over publications.

Public workshops

Participants at the public workshop were mostly critical of Rothamsted's engagement in this hypothetical project. It was noted by some that the purpose of the research could contribute to the public good by reducing malaria infections. However, many expressed concerns that the profit making incentives of the private collaborator would prevent this. In this vein participants argued that the company might take the product to market in more profitable areas that do not suffer from Malaria problems. Related to this were concerns that contractual arrangements gave too much control over outputs to the private collaborator, arguing that this would undermine the ability to use products developed for humanitarian purposes.

Public participants suggested a few measures that could be taken to mitigate these issues. The inclusion of a humanitarian usage clause and a cap on the length of time a company could have exclusive intellectual property ownership were popular suggestions. Some also argued that the private collaborator should have a duty to reinvest some of the profits in the public purse and that Rothamsted should place a higher valuation on their services, either in a bigger up-front payment or a bigger share in profits.

Stakeholder workshop

Stakeholder discussions on the Mosquito repellent case study focussed more upon constraints placed upon company ownership of outputs and upon the ability of Rothamsted researchers to publish and thus further their careers. There were mixed views as to whether Rothamsted should take on the project, with some arguing that such projects might provide Rothamsted with valuable resources and thus maintain other research activities, and others expressing concerns similar to the public participants

regarding conflicts between Rothamsted's mission statement and the private collaborator's profit making motives.

Collaborative workshop

Discussions at the collaborative workshop built upon previous rounds by focussing on the need to reconcile research priorities with commercial interests. Opinions against involvement in the project noted the importance of choosing collaborators on the basis of ethical criteria, rather than purely for financial gain, and expressed concerns that private ownership of outputs might prevent knowledge and products from benefitting mankind as a whole. Those expressing more favourable opinions towards collaboration argued for a more pragmatic approach - although they favoured Rothamsted's mission, they argued that Rothamsted's sustainability should be included in the definition of the public good and that private collaborations which contribute to financial stability should be pursued. Some also argued that working with ethically questionable companies might be acceptable if the research has the potential to produce outputs that will improve the human condition. Thus, they suggested that partnering criteria should focus on the nature of the project and not on the nature of the partner.

Case Study 2: Pesticides and Salmon Stocks

In this case study, Rothamsted provides public comments that discard suspected negative impacts of a pesticide developed by a private company upon local Salmon stocks. However, Rothamsted's credibility is put in doubt by the fact that the institute has received funding from the company in question in the past.

Public workshops

There was a consensus amongst public participants that working with industry could undermine Rothamsted's independence and that Rothamsted should avoid such a situation. Some participants saw this conflict as irreconcilable and argued that Rothamsted should choose whether the institute wants to maintain an independent voice or work with industry.

Others, however, suggested some measures that Rothamsted might take to safeguard its reputation whilst working with industry. The main recommendation was openness and transparency and the release of data and information that would enable independent evaluation of Rothamsted's position by both the public and other scientists.

Stakeholder workshop

Stakeholders expressed more mixed views on this scenario. Like the public participants, some stakeholders argued that Rothamsted should avoid entering such situations, since it will always lead to suspicion. However, others argued that Rothamsted should decide whether to speak out, on the basis of the quality of science, and not based on considerations revolving around public relations.

Collaborative workshop

Participants at the collaborative workshop also expressed mixed views regarding this case. Those against Rothamsted's behaviour in the hypothetical scenario argued that Rothamsted should not express views on matters where there is a conflict of interests. Some also noted that Rothamsted may not be well placed to contribute to the debate. Those in favour of Rothamsted expressing their opinion in this case tended to echo the favourable stakeholders, noting that it is the quality of science that should determine whether Rothamsted intervenes. Moreover, some argued that Rothamsted has a duty to speak out on such issues in order to advance the public good. On a more practical note, one participant argued that it is the default position to comment on a controversial issue when approached by the media in order to avoid suspicion.

The theme of openness and transparency again emerged as the most important mitigator in this scenario. Participants noted that transparency is the best defence against suspicions and criticisms of conflicting interests. Some also argued that increasing public understanding of Rothamsted's work through public engagement and communication might also mitigate such suspicions.

Case Study 3: Improving the Nutritional Quality of Food

Finally, in case study three Rothamsted researchers face a dilemma whereby their freedom to publish the results of research, develop research proposals and choose research partners is constrained by confidentiality agreements developed with collaborators on a previous project that new research would build upon.

Public workshops

Discussion at the public workshop generally focussed around the conflict between gaining resources from industry to carry out important research and the principle that all Rothamsted research should be openly published. Opinions in favour of industry collaboration in this case argued that Rothamsted's financial sustainability should be prioritised, since without resources the institute simply would not be able to continue work on the same scale. This was seen as a major issue because Rothamsted's research was understood to be important in meeting pressing challenges of food security. More critical opinions, however, highlighted the 'non-negotiable' principle that Rothamsted should remain a public entity with a primary focus upon scientific progress that can freely publish its work. Thus, some participants expressed concerns that Rothamsted could become a contract-based research organisation or a 'designer company'.

The main measures proposed to deal with these issues related to contract negotiations. Some highlighted the need for rigorous planning in anticipation of any potential repercussions from collaborating with an industry partner. Participants also noted the need for Rothamsted to select industry partners on the basis of ethical criteria, and argued in favour of a capped time limit on private IP exclusivity.

Stakeholder workshop

Stakeholder discussions noted the intrinsic complexity of IP ownership in science. One stakeholder noted that all scientific projects stand on the shoulders of previously generated knowledge. This has two implications. Firstly, demarcations of IP can be very

artificial and secondly private IP can block the progress of science. Despite these difficulties, some stakeholders noted that embarking on projects that will produce privately owned IP might generate resources that can fund other research projects and thus contribute to the public good.

In order to mitigate these tensions, stakeholders suggested time-limited patents – along the same lines as the public – and also argued that Rothamsted should value itself more highly and position itself as a ‘partner of choice’ rather than ‘chasing’ industry partners and conforming to their demands.

Collaborative workshop

Participants at the collaborative workshop also expressed mixed views. Those in favour of industry collaboration noted the importance of project-based criteria: if the research will lead to outputs that benefit society, then the collaboration should go ahead regardless of the partner. Those against collaboration argued that Rothamsted should not prioritise profit over ethical considerations when partnering.

Participants highlighted many of the same measures as those proposed at the public and stakeholder workshops, but also noted that Rothamsted should maintain a broad industry funding portfolio to avoid over-dependence on one partner and thus improve its negotiating position.

Appendix 5. Materials and process design

Overview

The dialogue process consisted of four workshops:

- Two on the 22th of January with members of the public from Exeter and Harpenden
- One on the 25th of January in London with stakeholders from across the UK
- One on the 8th February in London with stakeholders and members of the public who volunteered at the first public workshops.

Participants were provided with a series of educational materials and exercises. These were basically scenarios to which guiding principles could be applied:

- Scenario: Guiding principles for local NHS commissioning
- Case study 1: Mosquito repellent collaboration
- Case study 2: Pesticides and salmon stocks scandal
- Case study 3: Working with industry to improve the nutritional quality of food

The NHS commissioning scenario was used in the first two public workshops in order to allow the public to develop an acquaintance with the concept of an organisational guiding principle. Case studies 1, 2 and 3 were used in the public workshops to illustrate the kinds of tensions that arise from working with industry and allow participants to begin to develop guiding principles. The cases were also referred to in the stakeholder workshop and the collaborative workshop.

The first part of this appendix provides the workshop materials used to introduce each scenario. The second part provides an overview of participants and the summary agendas for each of the workshops.

Workshop Materials: Scenarios and case studies

Educational material: The NHS and guiding principles

Definition of a guiding principle

'An idea that influences you very much when making a decision or considering a matter.'
(Cambridge Dictionaries Online)

'Any principles or precepts that guide an organization throughout its life in all circumstances, irrespective of changes in its goals, strategies, type of work, or the top management.' (www.businessdictionary.com)

Making decisions is a part of people's everyday lives. We are confronted with situations on a daily basis that require us to weigh up a situation, and decide upon a course of action. Underpinning these processes are different opinions, attitudes and moral codes that we have picked up from our life experience and have internalised. For this reason, different people will take different decisions when confronted with similar scenarios. We might see these opinions, attitudes and moral codes as our own internal 'guiding principles'.

What we are concerned with in this exercise is somewhat similar to this, but instead of thinking about the individual decisions that we take on daily basis (e.g. whether to walk, drive or take the bus to work, have coffee or tea, or wait until the light goes green before crossing the road), we would like to think about group-based decisions that affect not the behaviour of individuals but of a group or organisation.

Guiding principles for the NHS

The British NHS (a publicly funded, state-run and universal healthcare service) has established itself as one of our most valued institutions, with all main political parties supporting its aim to provide free healthcare to Britain's population. It is also a very large and complex organisation which is extremely challenging to administer effectively. Those in charge of running the NHS, from ministers and civil servants in Whitehall to healthcare staff and managers in surgeries and hospitals, have to make difficult decisions on a daily basis that will result in creating different 'winners and losers'. Some basic NHS principles that, and can be applied in situations where difficult decisions have to be made, guide this decision making can be identified. In this section, we outline these principles and explain the kinds of tensions, contradictions and conflicts that they are intended to guide decision makers through.

In the following exercise we will ask you to apply these to a hypothetical scenario regarding the delivery of healthcare in your locality.

Principles that guide the NHS^{xxiii}

Principle 1: "The NHS provides a comprehensive service, available to all, that is based on clinical need, not an individual's ability to pay".

This is perhaps the principle lying at the heart of the NHS. In privately run healthcare systems the need to pay for healthcare or attain insurance determines the availability of care for individuals.

This can increase resources available and increase the quality of treatment for those who can afford care, but can lead to significant elements of the population being excluded from the system.

The NHS was specifically developed to avoid this exclusion; everyone is of equal value, and individual's own circumstances and ability to pay does not matter.

Principle 2: “The NHS aspires to the highest standards of excellence and professionalism”

Healthcare professionals require much training and education that it is expensive to provide. As such they are relatively expensive employees for an organisation.

Britain has a mixed healthcare system, where doctors can work for private providers or the NHS. Arguably, private providers are in a position to offer better salaries and therefore attract more qualified and experienced professionals, potentially decreasing the quality of treatment available in the public NHS.

In order to avoid this, the NHS is committed to providing excellent clinical service and hiring the professionals needed to do this.

Every patient wants to receive the highest quality care available and the NHS strives to achieve this. But it can only manage this if it has highly trained and experienced healthcare professionals.

Principle 3: “The NHS aspires to put patients at the heart of everything it does”

Healthcare is a complex area that requires much specialisation. As such, healthcare providers are often highly educated and have a level of clinical expertise that far exceeds that of most patients.

This can lead to a situation where healthcare professionals have power and influence over patients, and can also make the opinions of patients and their experience of treatment seem less important, when really, they are the reason for the existence of the NHS.

While patients want high quality care they also want to have a voice in their care. One of the factors that clinicians often overlook is the patient's experience of care. A focus on delivering high quality clinical outcomes can mean that the patient experience can be overlooked.

In order to avoid this NHS code of practice highlights the need to gather information from patients regarding their experience of care, and to place considerations of patient's needs and experiences at the heart of the development of treatment policies and protocols.

Principle 4: “The NHS works across organisational boundaries and in partnership with other organisations in the interest of patients, local communities and the wider population”

Although there is much clinical expertise in the NHS, it is also true that people from other organisations like businesses or charities have expertise or information that can be important in improving treatment.

If the NHS operated by itself it could miss out on the opportunity to take advantage of knowledge and expertise outside the organisation. For this reason, the NHS encourages hospitals, surgeries and other centres to work in partnership with local organisations that employ people who can contribute to improving care.

Many critics are opposed to the idea that private companies provide public services, arguing that their profit making interests may lead them to ‘cut corners’ in order to decrease their expenses and improve their ‘bottom line’.

Principle 5: “The NHS is committed to providing best value for taxpayers/ money and the most effective, fair and sustainable use of finite resources”

Although the NHS aims to provide universal healthcare, it is an organisation with limited resources. Different kinds of treatments for different conditions vary in cost, and this means that NHS policy makers and regulators have to make decisions regarding which treatments should be made available. For example, would it be fair to spend 20% of the budget on a very expensive treatment of a serious condition that affects a very small minority, or to spend an equivalent amount on treatment of a serious condition that is much more widespread?

Those that make decisions on these issues must take principle 5 into consideration to guide their decision making.

Principle 6: “The NHS is accountable to the public, communities and patients that it serves”.

An important concern raised by critics of large state-run enterprises like the NHS is that, because they do not operate in a market where the ‘laws’ of supply and demand can keep services responsive to consumers, they can become remote and self-serving bureaucracies.

In order to avoid this, the NHS stresses the importance of services being scrutinised by citizens, local communities and patients, or representatives of these groups, be that in Whitehall and parliament or civil society.

Also, in a representative democracy like the UK it is important that decisions and policies on areas of public spending (such as healthcare services) be transparent and open to scrutiny by citizens and their representatives.

Scenario: Applying principles to your local surgery

In an attempt to improve the quality of healthcare provision, the current coalition government has allowed local GPs to decide where they can provision services from.

Looking to take advantage of this new policy, your local GP surgery is considering using a private clinic for some of its services, such as taking blood and doing ultrasounds. This would mean that some patients would be referred by your local GP to this private clinic where they would receive free treatment, for which the NHS would pay the private clinic.

You don't see the GP very often at all, so you are not really worried about the standard of care for you personally. But you are a taxpayer and you want to make sure that public money is well spent, and are also concerned about the quality of service for your fellow community members.

Questions and issues

- What might concern you about the idea of your local GP spending part of the surgery's budget on private service?
- What would be needed to reassure you?
- What might concern you about the relationship between the GP and a private clinic?
- Are any of the above principles is it important to adhere to in this context?
- What additional ones would you add in?

Case study 1: Mosquito repellent

Rothamsted researchers usually work on publicly funded projects, where it is expected that the results of research will be published in peer-reviewed academic journals. However, publication is often against private firms that Rothamsted might collaborate with because it limits the exclusivity of their access to findings and therefore the ability to generate profitable products.

Also, another controversy is that some privately funded research is based on previous findings from publicly funded research, but leads to knowledge or products which private companies can patent and profit from.

For example, in a hypothetical scenario, scientists from a pharmaceutical company read the results from a government funded study on the mosquito repelling properties of the Citronella plant. They identify an opportunity to develop a more effective natural mosquito repellent but need to carry out more research in order to do this.

They approach Rothamsted scientists with a proposition to fully fund the research and provide a 1% share of global profits.

This is not the kind of project that Rothamsted (an agricultural research institute) usually engages in, but it offers a lucrative deal that can provide resources for further research that fits more closely with Rothamsted mission statement. It also provides an opportunity to develop a product that provides relief from insect bites and contribute to the fight against world infections like Malaria and Dengue. There is also a humanitarian rationale for the project.

However, the company wants exclusive ownership over all the results and products developed, meaning that they have veto power over any publications that Rothamsted researchers might develop based on the project (thereby controlling the availability of information in the public domain) and grants no rights to use products to other parties, including humanitarian access rights (rights to use products for humanitarian reasons, e.g. to provide relief following a natural disaster).

Case study 2: Pesticides and Salmon Stocks

As well as having a formal role on regulatory committees, Rothamsted researchers speak and / or write publicly on political issues of science relating to their expertise, often informing public opinion and government policy.

The public trusts the opinions of Rothamsted researchers as an authoritative, independent voice. In order for this trust to be maintained researchers must remain visibly trustworthy.

However, closer links to industry might create a situation where the independence and integrity of Rothamsted's advice relating to products from collaborator companies is put to question.

Take this hypothetical scenario. Local Scottish fishermen have noted a rapid reduction of salmon stocks in their local rivers. The science is unclear, but locals firmly believe that this is down to a new pesticide used by local farmers that is infecting river waters. Under public pressure, the Scottish Government considers acting to ban the use of this pesticide, and calls for expert opinion on the issue.

Rothamsted researchers, who have shared projects with the agro-chemical company that developed the pesticide, have a sound scientific basis upon which to conclude that reduction in fish stocks is not attributable to this product. They release a press release to this effect, which receives national media attention. As a result of this, campaigners from Environmental organisations opposing pesticides use their airtime on the issue to question the integrity of Rothamsted researchers, pointing to previous experiences, such as in the tobacco industry, where scientific advice was biased and served big business at the cost of the public interest. Rothamsted risks reputational damage as well as losing its voice as an independent authority on the matter.

Case study 3: Improving the nutritional quality of food

Rothamsted researchers often find that industry is not only the best source of funding for particular work, but it also has crucial expertise that can be valuable in research. Working with industry is often important to success, but it can create limitations for Rothamsted's freedom to operate as it usually would.

For example, researchers at Rothamsted recently developed a way of improving the nutritional quality of food and were keen to work with experts in the food industry to find ways of applying the benefits of this new technology to food production and processing.

A joint project was developed which was funded both by a group of companies and the government. This produced interesting results that should be useful in producing better quality food. The companies involved are keen to use the results as soon as possible to develop products but want to keep results secret until they have a patent, so they can profit.

This presents three problems to Rothamsted.

Firstly, as a public research institution, Rothamsted has a duty to publish its results. Also, scientific publications are crucial to the careers of Rothamsted scientists involved in the project.

Secondly, some companies want to involve Rothamsted in product development, but since they are in competition with each other they do not want the results of the project to be shared. So, if Rothamsted cannot find a way of keeping the projects separated, it will need to choose one company above the others.

Finally, the original research used a computer based modelling system and data provided by another public research institute. This system is very important for further research, but the other institute does not allow its data and systems to be used for commercial purposes. If Rothamsted works with the companies and cannot successfully negotiate access to the system with the other public institute, it will not be able to use this system.

Questions for participants:

- What are the issues involved in each case study?
- Which issues do you think the research institution and the industry organisation might have different views on?
- Which issues do you think are of particular public interest (e.g., relate to good use of taxpayers' money)?
- What guiding principles might help in each case study?
- Where are there overlaps in the guiding principles for each case study?

Process design: public workshops

Factors informing process design

This process design takes into account the following:

- The need to provide participants with the necessary information in the form of 'building blocks', to enable them to actively engage with the issues
- Ensuring that information is adequate and relevant and that additional detail is available if required, without being excessive
- The need to check understanding of the issues as the process continues
- The importance of designing in a variety of activities to maintain momentum and interest

The process design has been informed by information gathered through interviews with stakeholders, desk research, and input from the Oversight Group and Management Group.

Attendees

Each public workshop will be attended by:

- Up to 25 recruited members of the public
- 3 OPM Group facilitators
- 2-3 Rothamsted Research representatives

Workshop outputs

- Documentation of first iteration of citizen principles
- Participants have a good understanding of subject the matter and dialogue process
- Participants have enjoyed the day and had meaningful conversations with others, encouraging them to keep engaging with the theme and the dialogue process

Agenda

Time	Session
10.00 - 10.30	Arrival, registration, coffee
10.30 - 10.45	PLENARY: Welcome, introductions and overview of the day Rothamsted OPM
10.45 - 11.10	What do we mean by guiding principles? Small table discussions
11.10 - 11.45	Introduction to Rothamsted Research Rothamsted Research presentation and Q&A

Time	Session
11.45 - 12.00 Coffee break	
12.00 - 12.35	Life of a Rothamsted scientist Rothamsted Research presentation and Q and A
12.35 - 13.15 Lunch	
13.15 - 14.30	Rothamsted case studies Small table discussions
14.30 - 14.50 Coffee break	
14.50 - 15.25	Challenge and prioritisation of guiding principles Plenary
15.25 - 15.40	Next steps
15.40 - 16.00	PLENARY: Close and thanks Evaluation questionnaires and 'thank you' payments

Process design: stakeholder workshop

Attendees

This workshop will be attended by:

- 20 - 25 stakeholders, including 5-6 Rothamsted Research staff
- 3 OPM Group facilitators
- 2 Rothamsted Research representatives from the Management Group

Workshop outputs

- Documentation of stakeholder principles and points of difference with citizen principles (this will be sent to participants to review prior to the next session)
- Develop stakeholder acquaintance with citizen understanding

Agenda

Time	Session
16.00 - 16.15	Arrival, registration, coffee
16.15 - 16.30	PLENARY: Welcome, introductions and overview of the workshop OPM

Time	Session
16.30 - 17.00	Introduction to Rothamsted Research Rothamsted Research presentation and Q&A <ul style="list-style-type: none"> - Overview of Rothamsted Research and its work with industry - Aims and objectives of the dialogue - Example(s) of working with industry
17.00 - 17.45	Rothamsted case studies Small table discussions to identify tensions and generate principles
17.45 - 18.00 Coffee and snack break (OPM to cluster principles)	
18.00 - 18.10	Challenge and clarification of guiding principles Plenary OPM to present back clustered principles and generate one set of principles on a flip chart
18.10 - 18.30	Review of outputs from the two public workshops Small table discussions to review public principles from 25 January workshops
18.30 - 18.50	Development of briefing statement Plenary Briefing statement to show stakeholder response to the following questions about the public's guiding principles: <ul style="list-style-type: none"> - Which of the public's guiding principles do you agree with? - What do you still have questions about? - What do you think is missing?
18.50 - 19.00	Next steps Close and thanks Evaluation questionnaires

Process design: collaborative workshop

Attendees

- Up to 30 reconvened members of the public (approximately half each from Exeter and Harpenden)
- 5 external stakeholder participants
- 4 Rothamsted stakeholder participants

Observers

- 2 Rothamsted staff (Matina and Andrew)
- Sciencewise (Daniel Start)
- 3KQ Evaluator (Susanne Turrall)

Workshop outputs

- Public participants' knowledge deepened - they have developed a considered judgement of issues
- Mutual understanding developed between experts and public
- Final principle statement based on considered judgement of public

Agenda

Time	Session
10.00 - 10.30	Arrival, registration, coffee
10.30 - 10.45	PLENARY: Welcome, introductions and overview of the day Rothamsted OPM
10.45 - 11.30	Sharing outputs from the public workshops Presentation and small group discussions
11.30 - 11.45 Coffee break	
11.45 - 12.30	What did stakeholders have to say? Developing a mutual understanding Presentation and small group discussions
12.30 - 13.15 Lunch	
13.15 - 13.30	Plenary Q and A
13.30 - 14.30	Focussed discussions and stress-testing of the principles Small group discussions
14.30 - 14.55	Finalising the principles Plenary Q and A and small group discussions
14.55 - 15.15 Coffee break	
15.15 - 15.40	Summary and prioritisation Plenary
15.40 - 15.50	Next steps
15.50 - 16.00	PLENARY: Close and thanks

Appendix 6. Recruitment materials

Recruitment specification

This public participant recruitment specification is based on:

- Recruiting 25 people to attend one workshop in Harpenden on Saturday 25 January 2014
- Recruiting 25 people to attend one workshop in Exeter on Saturday 25 January 2014
- c50% from each workshop attending a further workshop in London on Saturday 8 February 2014

Workshop: Sat 25 January, Harpenden. 50% to attend Sat 8 February, London

Age	Number	Segment	Gender	Ethnicity	Other quota
18 – 25	6	2 x C1 2 x C2 2 x DE	50/50 M/F throughout (as close as possible)	Black/ Black British:	Nobody who works in the media industry Attitudinal questions:
26-40	7	2 x B 2 x C1 1 x C2 2 x DE		At least 2 Black/ Caribbean and at least 2 Black/ African	<i>Do you work in any of these industries or professions?</i> 1. <i>Farming</i> (BETWEEN 0 AND 3 RESPONDENTS)
41-55	6	1 x B 2 x C1 1 x C2 2 x DE		Asian/Asia British	2. <i>Biotechnology</i> (BETWEEN 0 AND 3 RESPONDENTS)
56-70	6	2 x B 1 x C1 2 x C2 1 x DE		At least 2 British Indian, At least 2 Asian others/ Chinese	3. <i>Environmental campaigning</i> (BETWEEN 0 AND 3 RESPONDENTS)
				17 remainder white / other	<i>Have you heard of Rothamsted Research?</i> Yes (AT LEAST 5 RESPONDENTS) No (AT LEAST 10 RESPONDENTS) Participants must live in Hertfordshire or

Age	Number	Segment	Gender	Ethnicity	Other quota
					Bedfordshire AT LEAST 4 participants must be recruited from the following postcodes: <i>LU1/ LU2/ LU3/ LU4 (Luton)</i> AT LEAST 5 RESPONDENTS <i>AL5 (Harpenden)</i> AT LEAST 4 RESPONDENTS <i>AL1 (St Albans)</i> AT LEAST 4 RESPONDENTS <i>AL3/AL4</i> AT LEAST 4 RESPONDENTS

Workshop: Sat 25 January Exeter, 50% to attend Sat 8 February, London

Age	Number	Segment	Gender	Ethnicity	Other quota
18 – 25	6	2 x C1 2 x C2 2 x DE	50/50 M/F throughout (as close as possible)	Black/ Black British:	Nobody who works in the media industry Attitudinal questions: <i>Do you work in any of these industries or professions?</i> 1. <i>Farming</i> (BETWEEN 0 AND 3 RESPONDENTS) 2. <i>Biotechnology</i> (BETWEEN 0 AND 3 RESPONDENTS) 3. <i>Environmental campaigning</i>
26-40	7	2 x B 2 x C1 1 x C2 2 x DE		At least 2 Black/ Caribbean/ Black/ African Asian/Asia British:	
41-55	6	1 x B 2 x C1 1 x C2		At least 2 British Indian/ Asian others/ Chinese	

Age	Number	Segment	Gender	Ethnicity	Other quota
		2 x DE			(BETWEEN 0 AND 3 RESPONDENTS)
56-70	6	2 x B 1 x C1 2 x C2 1 x DE		21 remainder white / other	<p><i>Have you heard of Rothamsted Research?</i></p> <p>Yes (AT LEAST 5 RESPONDENTS)</p> <p>No (AT LEAST 10 RESPONDENTS)</p> <p>Participants must live in Devon</p> <p>Participants must be recruited from AT LEAST 5 different Devon postcodes</p>

Recruitment questionnaire

The following recruitment questionnaire was designed to fulfil the recruitment specification above.



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London SW19 8RR

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Facsimile +44 (0)20 8254 4440

email plus4@plus4.co.uk

Web www.plus4.co.uk

PROJECT: Relationship between industry and scientific research

JOB NO:

INTRODUCTION

Good morning/afternoon, I am from Plus Four Market Research Limited, we are working together with the OPM Group of behalf of Rothamsted Research researching citizen views on the relationship between industry and scientific research. We want to understand your views on how research bodies in the UK and industry should work together in the future. You don't need to know anything

about science or industry; we are just interested in the views of the general public. If you would be interested in taking part in two one-day workshops on Saturday 25 January and Saturday 8 February may I just ask you a few questions?

The 25 January workshop will be in Exeter/Harpenden and you will also be invited to the 8 February workshop in London. You will be recompensed for travel and accommodation to the London workshop.

SHOWCARD X

QA Do you work in any of these industries or professions?

QB Do you, or any of your close friends or relatives, work in any of these industries or professions?

MARKET RESEARCH	N		PUBLIC RELATIONS	N
TV OR THE MEDIA	N		JOURNALISM	N

IF ANY 'N' CIRCLED ➡ CLOSE

Q1) Do you work in any of these industries or professions?

- Farming
- Bio-technology
- Environmental campaigning

Interviewer Note: Please check your quota

Q2) Do you live in Devon? (For Exeter workshop)

- Yes 1 ➡ Continue
- No 2 ➡ Close

OR

2) Do you live in Hertfordshire or Bedfordshire? (For Harpenden workshop)

- Yes 1 ➡ Continue
- No 2 ➡ Close

Q3) Can I ask what is the first part of your postcode?

.....

Interviewer Note: Please check quota re: postcodes of participants

Q4) Have you heard of Rothamsted Research?

Yes
No

Interviewer Note: Please check your quota

Q5) Have you ever been to a public dialogue event before?

Yes	1	How long ago was that?	Less than 6 months	1	CLOSE
No	2		6-12 months ago	2	CLOSE
			More than 1 year ago	3	

What was the subject of the discussion group(s)/interviews you attended?

Write in:..... (If related to farming, agriculture in general, scientific research, working with industry)
CLOSE

<p>CLASSIFICATION</p> <p>Age: Write in</p> <table border="0"> <tr> <td style="vertical-align: middle;"> 18-24 25-34 35-44 45-54 55-64 65+ </td> <td style="font-size: 3em; vertical-align: middle; padding: 0 10px;">}</td> <td style="vertical-align: middle;">CHECK QUOTA</td> </tr> </table> <p>Gender: Male 1 Female 2</p>	18-24 25-34 35-44 45-54 55-64 65+	}	CHECK QUOTA	<p>What is the occupation of the chief income earner in your household? Write in:</p> <p>Job title/Rank/Grade if Civil Service? (Police etc.) Write in:</p> <p>How many people is he/she responsible for: Write in:</p> <p>Special training or qualifications (egg. degree/apprenticeship) Write</p>
18-24 25-34 35-44 45-54 55-64 65+	}	CHECK QUOTA		

<p>Marital Status:</p> <table> <tr><td>Married/Similar</td><td>1</td><td rowspan="4">}</td><td rowspan="4">Check quota</td></tr> <tr><td>Married/similar with Children</td><td>2</td></tr> <tr><td>Single parent</td><td>3</td></tr> <tr><td>Single</td><td>4</td></tr> </table> <p>Status of Respondent:</p> <table> <tr><td>Full-time working</td><td>1</td></tr> <tr><td>Part-time working</td><td>2</td></tr> <tr><td>Non-working</td><td>3</td></tr> <tr><td>Retired</td><td>4</td></tr> </table> <p>Ethnicity:</p> <table> <tr><td>White British</td><td>1</td><td rowspan="7">}</td><td rowspan="7">Check quota</td></tr> <tr><td>White Other</td><td>2</td></tr> <tr><td>Asian</td><td>3</td></tr> <tr><td>Black</td><td>4</td></tr> <tr><td>Caribbean/African</td><td>5</td></tr> <tr><td>Other Non-White</td><td>6</td></tr> <tr><td>Mixed</td><td>7</td></tr> </table>	Married/Similar	1	}	Check quota	Married/similar with Children	2	Single parent	3	Single	4	Full-time working	1	Part-time working	2	Non-working	3	Retired	4	White British	1	}	Check quota	White Other	2	Asian	3	Black	4	Caribbean/African	5	Other Non-White	6	Mixed	7	<p>in: _____</p> <p>Type of organisation: (Write in) _____</p> <p>IF RETIRED: Details of previous occupation and pensions Write in: _____</p> <p>Socio Economic Group:</p> <table> <tr><td>B</td><td rowspan="4">}</td><td rowspan="4">Check quota</td></tr> <tr><td>C1</td></tr> <tr><td>C2</td></tr> <tr><td>DE</td></tr> </table> <p>Interviewer: The event you will be attending may be videoed/audio recorded and the client might attend and observe the event. An anonymised transcript of discussions will also be archived to inform future dialogues. Are you happy to take part under these conditions?</p> <table> <tr><td>Yes</td><td>1</td></tr> <tr><td>No</td><td>2</td></tr> </table> <p>Thank & Close</p>	B	}	Check quota	C1	C2	DE	Yes	1	No	2
Married/Similar	1	}			Check quota																																								
Married/similar with Children	2																																												
Single parent	3																																												
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Full-time working	1																																												
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C1																																													
C2																																													
DE																																													
Yes	1																																												
No	2																																												

Appendix 7. Oversight Group membership

Oversight Group

Chair: Professor Judith Petts CBE, Dean, Social and Human Sciences, University of Southampton

Members:

Professor David Castle, Chair of Innovation in Life Sciences, Director MSc BIG Programme, ESRC Innogen Centre, University of Edinburgh

Mr James Dancy, Head of Sustainable Agriculture Team, Sustainable and Competitive Farming Strategy, Defra

Professor Linda Field, Head of Biological Chemistry and Crop Protection Department, Rothamsted Research

Mr Stephen James, Associate Director – Operations, Rothamsted Research

Dr Gordon Jamieson, Knowledge Exchange and Commercialisation Director, John Innes Centre

Mr Paul Leonard, Trustee/Director - Board of Directors Rothamsted Research, Head of Innovation and Technology Policy at the BASF Group, Director - Board of British Chamber of Commerce in Belgium

Dr Julian Little, Communications and Government Affairs Bayer CropScience, Chair of the Agricultural Biotechnology Council

Ms Yolanda Rugg, Chief Executive, Hertfordshire Chamber of Commerce

Mr Geoff Tansey, Trustee/Member, Food Ethics Council, Writer and Consultant

Ms Amanda Yorwerth, St Albans Friends of the Earth and Presenter Environment Matters Radio Verulam

Management Group

Lead: Dr Matina Tsalavouta, Communications Officer, Rothamsted Research

Dr Andrew Spencer, Head of Knowledge Exchange and Commercialisation, Rothamsted Research

Dr Darren Hughes, Head of External Affairs, Rothamsted Research

Dr Patrick Middleton, Head of Public Engagement, BBSRC

Mr Daniel Start, Dialogue and Engagement Specialist, Sciencewise

Mr James Tweed, Public Dialogue Project Manager, Sciencewise

Appendix 8. List of references

- ⁱ See <http://www.foodsecurity.ac.uk/assets/pdfs/gfs-exploring-public-views.pdf>
- ⁱⁱ See, for example, Perkmann, M. and Walsh, K. (2007). "University-industry relationships and open innovation: towards a research agenda", *International Journal of Management Reviews*. Vol 9, (4): 259-280.
- ⁱⁱⁱ Sciencewise is funded by the Department for Business, Innovation and Skills (BIS). Sciencewise aims to improve policy making involving science and technology across Government by increasing the effectiveness with which public dialogue is used, and encouraging its wider use where appropriate to ensure public views are considered as part of the evidence base. www.sciencewise-erc.org.uk.
- ^{iv} The appendix comprises seven sections. Sections 1, 2 and 3 present a summary of the discussions in the public, stakeholder and collaborative workshops that made up the dialogue. Section 4 presents an account of the responses to the case studies presented to stimulate discussion at the public, stakeholder and collaborative workshops. Section 5, 6 and 7 contain information on the process design and materials used throughout the dialogue (5), the materials used to recruit public participants and stakeholders (6) and details of oversight group membership (7).
- ^v See, for example, Christiano, T. (2012). "Rational Deliberation amongst Experts and Citizens", in Parkinson, J. and Mansbridge, J. *Deliberative Systems: Deliberative Democracy at the Large Scale*. Cambridge: Cambridge University Press.
- ^{vi} Davies, G. and Burgess, J. (2004). 'Challenging the "View from Nowhere": Citizens' Reflections on Specialist Expertise in a Deliberative Process'. *Health and Place*. Vol. 10: 349-361, see also, Burgess, J. Stirling, A. Clark, J. Davies, G. Eames, M. Staley, K. and Williamson, S. (2007). 'Deliberative Mapping: A Novel Analytic-Deliberative Methodology to Support Contested Science-Policy Decisions'. *Public Understanding of Science*. Vol. 16, (3): 299-232.
- ^{vii} The Government's approach to public dialogue is detailed here <http://www.sciencewise-erc.org.uk/cms/guiding-principles/>
- ^{viii} See, for example, Flyvberg, B. (2002). *Making Social Science Matter: Why Social Inquiry Fails and How it Can Succeed Again*. Cambridge University Press.
- ^{ix} See, for example, Escobar, O. (2011). *Public Dialogue and Deliberation: A Communication Perspective for Public Engagement Practitioners*. Edinburgh: Beltane Public Engagement Network
- ^x Acworth, E.B. (2008). "University–industry engagement: The formation of the Knowledge Integration Community (KIC) model at the Cambridge-MIT Institute", *Research Policy*, Vol. 37, (8): 1241-1254.
- ^{xi} Santoro, M. and Betts, S. (2002). "Making University-Industry Partnerships Work", *Research-Technology Management*. Vol. 45, (3): 42-46. See also Abreu, M. Grinevich, V. Hughes, A. Kitson, M. and Ternouth, P. (2008). *Universities, Business and Knowledge Exchange*. Council for Industry and Higher Education and Centre for Business Research.
- ^{xii} Feldman, M. and Desrobers, P. (2003). "Research Universities and Local Economic Development: Lessons from the History of the Johns Hopkins University", *Industry and Innovation*. Vol. 10, (1): 5-24. See also Bercovitz, J. and Feldmann, M. (2006). "Entrepreneurial Universities and Technology Transfer: A Conceptual Framework for Understanding Knowledge-based Economic Development", *Journal of Technology Transfer*, Vol. 31: 175-188.
- ^{xiii} NVivo is a qualitative data analysis computer software package designed for use on qualitative, unstructured data. http://www.qsrinternational.com/products_nvivo.aspx?utm_source=NVivo+10+for+Mac
- ^{xiv} See e.g. Spencer, L. Ritchie, J. and O'Connor, W. (2003). "Carrying out Qualitative Analysis", in Ritchie, J. and Lewis, J. *Qualitative Research Practice*. SAGE
- ^{xv} See e.g. Lang, A. (2008). "Agenda-Setting in Deliberative Forums: Expert Influence and Citizen Autonomy in the British Columbia Citizens' Assembly", in Warren, M. and Pearse, H. (eds) *Designing Deliberative Democracy: The British Columbia Citizens' Assembly*. Cambridge: Cambridge University Press.
- ^{xvi} As outlined in the methodology and in appendix 5, three case studies were used in all the workshops, to illustrate the kinds of tensions that may arise from Rothamsted working more closely with industry
- ^{xvii} The draft principles in the margins of this chapter are those produced in each workshop – see appendices 1-3 for the full details of these outputs
- ^{xviii} Although participants discussed Rothamsted's status as a charitable organisation, they did not refer to the formal definition of 'public benefit' laid out in the Charities Act 2011 and in Charity Commission guidance, so the discussions described here should not be understood in that context. See: <https://www.charitycommission.gov.uk/detailed-guidance/charitable-purposes-and-public-benefit/>
- ^{xix} See: <http://www.bbsrc.ac.uk/organisation/policies/position/policy/joint-code-of-practice-for-research.aspx>
- ^{xx} At the end of the final collaborative workshop, the draft principles from each group were summarised into a final list. Public participants could place 5 votes each next to the principles they agreed with most strongly.
- ^{xxi} Rothamsted as a research council institute is governed by the Code of Practice on Research (<http://www.rcuk.ac.uk/Publications/researchers/grc/>), which includes guidance about data ownership, publication, and conflicts of interest, however this was not discussed in the workshops.
- ^{xxii} See also the independent evaluation report to be published separately to this report

^{xxiii} See - <http://www.nhs.uk/choiceintheNHS/Rightsandpledges/NHSConstitution/Documents/2013/the-nhs-constitution-for-england-2013.pdf>

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