

DFID's Support to Agricultural Research







Independent
Commission
for Aid Impact

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The Independent Commission for Aid Impact (ICAI) is the independent body responsible for scrutinising UK aid. We focus on maximising the effectiveness of the UK aid budget for intended beneficiaries and on delivering value for money for UK taxpayers. We carry out independent reviews of aid programmes and of issues affecting the delivery of UK aid. We publish transparent, impartial and objective reports to provide evidence and clear recommendations to support UK Government decision-making and to strengthen the accountability of the aid programme. Our reports are written to be accessible to a general readership and we use a simple ‘traffic light’ system to report our judgement on each programme or topic we review.

	Green: The programme performs well overall against ICAI's criteria for effectiveness and value for money. Some improvements are needed.
	Green-Amber: The programme performs relatively well overall against ICAI's criteria for effectiveness and value for money. Improvements should be made.
	Amber-Red: The programme performs relatively poorly overall against ICAI's criteria for effectiveness and value for money. Significant improvements should be made.
	Red: The programme performs poorly overall against ICAI's criteria for effectiveness and value for money. Immediate and major changes need to be made.

Executive Summary

This review assesses DFID's support to agricultural research. DFID has committed £350 million to agricultural research (2010-15) to improve food security and tackle hunger in developing countries. Activities range from advanced science research in UK universities to projects developing and testing innovative ways to get research products (such as new seeds or animal vaccines) into use by farmers. We examined a sample of seven projects supported by DFID. These include DFID's largest project, funding to the Consultative Group on International Agricultural Research (CGIAR), a global network of 15 international agricultural research centres. We assessed what results these programmes are achieving and how well they are designed and delivered. We focussed on whether they will improve food and nutrition security for poor people.

Overall *Assessment: Green-Amber* 

DFID has an effective and innovative agricultural research programme. It has contributed significantly to improved food security and nutrition for poor people in developing countries in the past and could do so in the future. The programme would have a greater impact on DFID's overall objectives if it focussed more on the needs of poorer farmers, especially women farmers, and poor people in urban areas needing access to cheap food. The main challenge DFID faces is to ensure that its research innovations are delivered effectively to farmers in Africa and Asia and taken beyond pilot to scale. As part of this, DFID's agricultural research and development programmes should collaborate better to accelerate learning and impact.

Objectives *Assessment: Green-Amber* 

DFID's agricultural research programme has clear, relevant and realistic objectives. There is an appropriate balance of short-, medium- and long-term research. DFID co-ordinates well with other donors but it needs to plan better the actions needed to ensure that successful research outputs (such as new crop varieties) result in improved food and nutritional security for poor people. It should address the needs of both men and women farmers, of farmers growing food for subsistence and of those actively engaging in markets. It should research how new technologies can be integrated into farming systems in environmentally sustainable ways.

Delivery *Assessment: Green-Amber* 

DFID's programme is efficient and well managed. It is delivering against its objectives. Financial management is sound. DFID's fiduciary controls are well developed. DFID monitors robustly its partners' expenditure against budget and milestones. DFID's partner organisations all have proven track records in delivering high-quality agricultural research for development. Due to the limited choice of suitable organisations, most are selected

without competition. DFID does not undertake systematic capacity assessments of its partners. This introduces the risk that it may overestimate its partners' capacity. DFID monitors project risks but does not systematically analyse risk across the programme.

Impact *Assessment: Green-Amber* 

Research is a long-term process. It can take many years to achieve the desired impact on poor farmers. There is good evidence that some of DFID's earlier investments in agricultural research have led to sustained improvements in agricultural productivity and poverty reduction, especially in South Asia. There are also strong indications that DFID's current research portfolio will deliver timely outputs with the potential to be taken to scale and benefit poor people. This will require effective delivery systems. DFID has ceased supporting some projects too soon without ensuring that successful research outcomes are taken forward by DFID or other organisations. This has limited their ultimate impact. It also has not involved beneficiaries sufficiently in its research projects which means new technologies generally have less impact.

Learning *Assessment: Amber-Red* 

Learning within the research programme is generally good and is used to refocus the portfolio and individual projects. The programme has learnt from best global practice in many areas but not on environmentally sustainable intensification. Research findings are well disseminated outside of DFID. Transparency of information is high. The agricultural research programme does not, however, work sufficiently with or learn from DFID country programmes and other departments to ensure research outputs are delivered to farmers. DFID partners do not evaluate their programmes sufficiently rigorously or frequently. DFID staff should visit projects more often and not rely on progress reports provided by partners.

Recommendations

Recommendation 1: DFID should ensure its agricultural research and development programmes collaborate better to deliver research outputs to farmers as quickly as possible and at scale to maximise the benefits for poor people.

Recommendation 2: DFID should develop explicit theories of change to map out the steps and partnerships needed to ensure research outputs lead to improved food security and nutrition for poor people and women.

Recommendation 3: DFID should aim to increase agricultural productivity, while minimising negative environmental impacts. It should focus strongly on environmentally sustainable intensification of agriculture.

1 Introduction

Introduction

1.1 This review considers the Department for International Development's (DFID's) £75 million annual funding for agricultural research. We examine the programme as a whole – which, in April 2013, comprised 16 different projects¹ – and focus on 7 projects in greater detail. These represent a spread of large, medium and small projects. They cover the different types of research that are funded as well as the different delivery channels applied.

1.2 The purpose of this review is to assess the value for money and effectiveness of DFID's support to agricultural research and its impact on poor people in developing countries. Our review is intended to improve the implementation of the current programme and to help shape future funding on agricultural research. We concentrated on DFID's decision-making processes, the quality of its delivery mechanisms and the impact of agricultural research funding.

Why invest in agricultural research?

There is global pressure on food production

1.3 One billion people in the world face hunger and do not have sufficient food to meet their dietary needs.² Between 2010 and 2050, food demand is expected to jump by 70%, due to a global population growth from 7 billion to 9 billion, as well as to changing food habits.³

1.4 There is an urgent need to increase agricultural productivity in developing countries. Between 1970 and 1995, the Green Revolution in Asia more than doubled food production. The challenges now are to maintain agricultural growth in Asia and to raise productivity in Africa, a continent where farming systems are more complex and there is increasing pressure on soil, water and other resources.⁴ Farmers in Asia and Africa also face the challenge of climate change,

which is likely to lead to higher temperatures and more erratic rainfall.⁵

Increases in food prices have driven policy commitments on food security

1.5 In 2007-08, after 20 years of relatively low and stable food prices, there was a sudden and rapid rise in global food prices. This severely affected poor people in developing countries. The number of hungry⁶ people increased by 105 million to 1.02 billion as a result of the rapid increase in food prices in 2007-08. There was another price spike in 2011 and average food prices globally are now 50% higher than those of 2007-08.⁷

1.6 The food-price spike in 2007-08 was a wake-up call to governments and donors who had under-invested in agricultural research and development over the preceding 20 years.⁸ It resulted in a series of high-level international commitments to mobilise international financing to achieve global food and nutrition security. These included two initiatives, launched at G8 summits: the L'Aquila Food Security Initiative launched in 2009 and the 2012 New Alliance on Food Security and Nutrition (see Figure 1 on page 3).⁹

1.7 To implement L'Aquila commitments, a multi-donor Global Agriculture and Food Security Program (GAFSP) was established by the World Bank to channel funds to public and private sector agricultural development investment. Ten donors, including the UK, have pledged a total of £823 million¹⁰ to the programme.¹¹

⁵ *World Development Report 2010: Development and Climate Change*, World Bank, Washington, D.C., <http://siteresources.worldbank.org/INTWDR2010/Resources/5287678-1226014527953/WDR10-Full-Text.pdf>.

⁶ The United Nations Food and Agriculture Organisation (FAO) defines a person as chronically hungry if food intake regularly provides less than their minimum energy requirements. The average minimum energy requirement per person is approximately 1,800 calories per day. The exact requirement is determined by a person's age, body size, activity level and physiological conditions, such as illness, infection, pregnancy and lactation. See: <http://www.fao.org/hunger/en/>.

⁷ S. Wiggins and S. Keats, *Looking back; peering forward: What has been learned from the food-price spike of 2007-2008*, Overseas Development Institute, London, 2013.

⁸ *World Development Report 2008: Agriculture for Development*, page 60, World Bank, Washington, D.C.

⁹ *Fact Sheet: G-8 Action on Food Security and Nutrition*, The White House, 18 May 2012, <http://www.whitehouse.gov/the-press-office/2012/05/18/fact-sheet-g-8-action-food-security-and-nutrition>.

¹⁰ We have translated into pounds sterling from US dollars, using the July 2010 to June 2013 average annual exchange rate. GAFSP was established in 2009 and has operated since mid-2010. ICAI takes exchange rates from <http://www.oanda.com/currency/average>.

¹ There were 16 on-going projects in the programme on 30 April 2013. The number had increased to 20 by 30 June 2013.

² *The State of Food Insecurity in the World*, FAO, Rome, 2010.

³ *How to Feed the World in 2050*, FAO, Rome, 2009. Changing food habits include eating more food per person and more livestock, dairy products and fish. Intensive livestock production increases global demand for cereals and other feed.

⁴ *World Development Report 2008: Agriculture for Development*, World Bank, Washington, D.C., http://siteresources.worldbank.org/INTWDRS/Resources/477365-1327599046334/WDR_00_book.pdf.

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Figure 1: Food security initiatives launched by the G8

The **L'Aquila Food Security Initiative (AFSI)** was launched at the G8 Summit in 2009. It aimed to mobilise large-scale donor resources to reverse 20 years of under-investment in agriculture and food security. Donors committed US\$22.4 million (£14.2 million) for a three-year investment programme over 2009-12. By December 2012, most of the funds had been delivered.¹² Funds were invested in projects designed to increase agricultural production, including rural roads, irrigation infrastructure and farmer advisory services and training. DFID contributed over £1.1 billion (8% of the total). It was disbursed for on-going projects (for example, rural poverty alleviation projects in Bangladesh) and new investments in multilateral programmes. These included £76 million to the multi-donor Global Agriculture and Food Security Programme (GAFSP), administered by the World Bank.¹³

The **New Alliance for Food Security and Nutrition (NAFS)** was launched at the G8 Summit in 2012. It is a joint initiative among African leaders, the private sector and donors. It aims to accelerate responsible public and private sector investment in African agriculture and lift 50 million people out of poverty by 2022.¹⁴ Nine African countries have joined the New Alliance. One more is expected to join by December 2013.¹⁵ DFID is a co-convenor of the New Alliance Leadership Council for 2013.¹⁶ DFID has committed £395 million over the next three years, including existing or planned programmes in Ethiopia, Ghana, Mozambique and Tanzania.¹⁷ This is in addition to the contribution to GAFSP.

- 1.8 The UK Government strongly supported these G8 initiatives. In addition, the Prime Minister held the 2012 Olympic Hunger Summit to focus global attention on hunger and nutrition. He also launched a special event on *Nutrition for Growth*:

¹¹ GAFSP is a development programme. DFID support is channelled through its International Division not the agricultural research programme. See: <http://www.gafspfund.org>.

¹² *L'Aquila Food Security Initiative Final Report 2012*, US Department of State, Washington D.C., 2012, <http://www.state.gov/s/globalfoodsecurity/rls/rpt/laquila/index.htm>.

¹³ *Business Case and Intervention Summary: Global Agriculture and Food Security Initiative*, DFID, 2012, <http://projects.dfid.gov.uk/IATI/document/3744990>.

¹⁴ *New Alliance for Food Security*, DFID, 2012, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/205883/new-alliance-factsheet.pdf.

¹⁵ *New Alliance for Food Security: 2013 Progress Report Summary*, DFID, 2012, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/208284/New-Alliance-Progress-Report-May2013.pdf.

¹⁶ The other co-convenors are the African Union Commission and the World Economic Forum.

¹⁷ *Global Food Security*, House of Commons, International Development Committee, Report HC 176, 2013. Written evidence from DFID, <http://www.parliament.uk/business/committees/committees-a-z/commons-select/international-development-committee/news/substantive-global-food-security-report-publication/>.

Beating Hunger through Business and Science prior to the 2013 UK G8 meeting. DFID is responding to current policy challenges.

- 1.9 DFID's agricultural research programme is designed to address the challenge of increasing food and nutrition security. Recently, it has been informed by the UK Government's 2011 Foresight Report on the future of food and farming.¹⁸ The Foresight Report analysed the pressures on the global food system between now and 2050 and the challenges of ensuring the global population is fed adequately and sustainably. It noted that many food production systems are currently unsustainable. It concluded that new systems of sustainable agriculture are needed which produce more food from the same area of land, while reducing adverse impacts on the environment. This is referred to as 'sustainable intensification'.

DFID has made a major financial commitment to support agricultural research

- 1.10 DFID and its predecessors¹⁹ have financed research to improve the productivity of farmers in developing countries for over 50 years. From 2003-04 to 2012-13, DFID spent £509 million on agricultural research (see Figure 2 on page 4). Approximately £244 million (48%) was channelled through the Consultative Group on International Agricultural Research (CGIAR) and the balance of £265 million (52%) through other research organisations. The CGIAR is a consortium of 15 global agricultural research centres, which are addressing the problems faced by developing countries.
- 1.11 Over the last decade, DFID's average annual agricultural research expenditure more than doubled, from £34 million in 2003-05 to £75 million in 2011-13. Over the same period, CGIAR's share of total expenditure increased from 23% to over 56% (see Figure A3 in the Annex).

¹⁸ *Foresight Report: Future of Food and Farming: Challenges and choices for global sustainability*, Government Office for Science, 2011, <http://www.bis.gov.uk/assets/foresight/docs/food-and-farming/11-546-future-of-food-and-farming-report.pdf>.

¹⁹ The Department for Technical Cooperation (1961-64) and either the Overseas Development Administration (ODA) or the Ministry of Overseas Development (ODM) from 1964 to 1997. DFID was established in 1997. See Owen Barder, *Reforming Development Assistance: Lessons from the UK Experience*, Center for Global Development Working Paper No. 70, Washington DC, 2005.

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Figure 2: DFID expenditure on agricultural research from 2003-04 to 2012-13

	£ millions	%
Consultative Group on International Agricultural Research (CGIAR)	244	48
Other research organisations	265	52
DFID's total agricultural research expenditure	509	100

DFID is focussing its research efforts on innovation

1.12 Since 2006, DFID has sought to transform its approach to agricultural research, with an emphasis on developing new products and making these available to farmers. DFID aims to run a flexible and innovative programme, which is responsive to new opportunities and challenges.²⁰ The current programme has three main objectives:²¹

- to develop new agricultural products to enable a sustainable intensification of agriculture. These new products – crop varieties, livestock breeds and more resilient and productive farming systems – will be needed to maintain and enhance productivity in the face of increasing climate change and resource scarcity;
- to test interventions and delivery models for rapidly scaling up the use of new technology to increase the supply of food to meet demand; and
- to increase the understanding of the complex political, social and economic context that determines the success of agricultural investments.

1.13 DFID's agricultural research programme targets the challenges of Africa, which missed out on the Green Revolution in the 1970s and 1980s. It also focusses on South Asia, where there is still extensive poverty. DFID has country programmes in most of the largest countries in Africa and South Asia. DFID's largest investment is in CGIAR. Although CGIAR has a global remit, it

also focusses much of its current research on Africa.

DFID finances four types of research, from the laboratory to market

1.14 In order to meet its objectives, DFID finances four different types of agricultural research:

- **Advanced science research:** this takes place in laboratories in the UK and other developed countries in partnership with scientists from developing countries. Advanced science is applied to agricultural systems to produce research outputs for use by scientists in developing countries. For example, a DFID-financed UK Research Council project used advanced genetic technologies in the UK to speed up the breeding process to enhance disease resistance and drought tolerance in African wheat varieties;²²
- **Applied research:** this takes outputs from advanced science research and develops products farmers can use. For example, the African Agricultural Technology Foundation (AATF) uses technologies from public and private research centres in the West and develops them into new varieties of crops, such as maize, cassava and other products for African farmers. It addresses the scientific, intellectual property, bio-safety and marketing issues necessary to get a new product to market;²³
- **Research uptake:** this develops and tests the best ways to get products for farmers into use, including market-based and other mechanisms. For example, DFID and other donors finance the AgResults²⁴ Initiative to test ways to provide incentives for private firms to market agricultural technologies in developing countries; and

²⁰ Agriculture Research Programme: What we are doing to support innovation, DFID, 2012.

²¹ Agriculture Team Programme Review and Priorities Paper (draft), DFID, March 2011.

²² M. Gill and L. Meagher, *Evaluation of the Sustainable Agriculture Research for International Development (SARID) programme*, page 24, University of Aberdeen, 2012,

www.gov.uk/government/publications/evaluation-of-the-sustainable-agriculture-research-for-international-development-sarid-programme.

²³ See: <http://www.aatf-africa.org/who-we-are-1>.

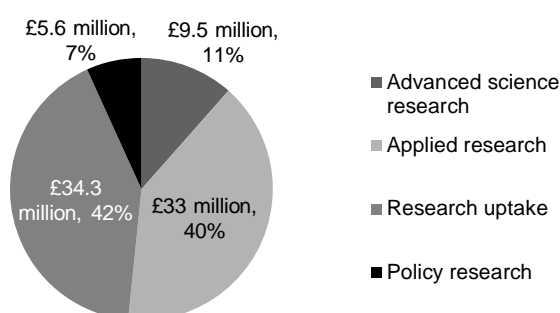
²⁴ The AgResults trust fund is managed by the World Bank, <http://web.worldbank.org/WBSITE/EXTERNAL/EXTABOUTUS/ORGANIZATION/CFPEXT/0,contentMDK:23005969-pagePK:64060249-piPK:64060294-theSitePK:299948,00.html>.

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- **Policy research:** this generates or synthesises evidence to influence policy. For example, the DFID-financed Future Agricultures Consortium²⁵ has researched the economic and political factors determining how African governments invest in agricultural research and development. DFID has also undertaken systematic reviews of research evidence on key policy issues, for example, the links between agriculture, health and nutrition.

1.15 Figure 3 summarises DFID's expenditure by type of research. A complete list of DFID's agricultural research projects over £1 million can be found in Figure A4 in the Annex.

Figure 3: DFID's planned expenditure by type of research, 2013-14



DFID uses different means to deliver its programmes

1.16 DFID uses four main delivery channels to deliver its agricultural research programme. These are:

- **Multilateral funding** through a trust fund or similar instrument. For example, funding to CGIAR is channelled through a trust fund-like arrangement, the CGIAR Fund, managed by the World Bank;
- **Memoranda of Understanding (MoU)** with established research organisations, such as the UK Biotechnological and Biological Sciences Research Council (BBSRC), the Bill and Melinda Gates Foundation²⁶ (hereafter referred to as the Gates Foundation) and the

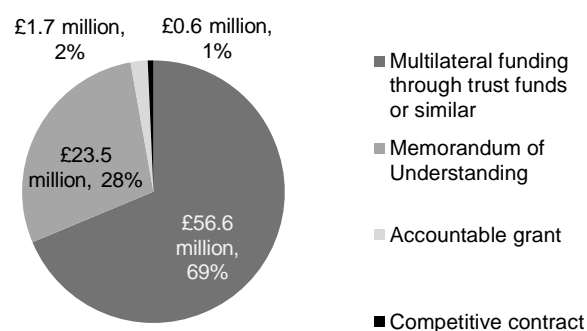
International Centre of Insect Physiology and Ecology (ICIPE);

- **Accountable grants** with not-for-profit organisations, such as the Global Alliance for Livestock Veterinary Medicines (GALVmed); and
- **Competitive contracts**, for example, with the Research into Use project and for independent impact evaluation of projects.

1.17 In 2013-14, DFID expects to spend 69% of funds through multilateral channels (see Figure 4).

1.18 DFID works closely with like-minded donors and foundations. These include the Gates Foundation and other donors such as the United States Agency for International Development (USAID). DFID invests in UK advanced science research centres through UK research councils. It also indirectly finances UK research centres through its grants to CGIAR and the Gates Foundation.

Figure 4: DFID's planned research expenditure by delivery channel, 2013-14



DFID follows UK Government policy on genetically modified organisms

1.19 DFID follows UK Government's policy on genetically modified organisms (GMOs). It recognises that GM technology could help address global food security challenges. DFID takes the view that developing countries should make their own informed decisions. Under this policy, DFID agrees to the planting of a GM crop if a robust risk assessment indicates that it is safe for people and the environment. GM product applications are assessed for safety on a case-by-case basis, taking full account of the scientific

²⁵ The Future Agricultures Consortium is an Africa-based alliance of research, www.future-agricultures.org.

²⁶ DFID finances a strategic collaboration for the sustainable intensification of agriculture with the Gates Foundation through a Memorandum of Understanding. It also collaborates closely with the Gates Foundation in the funding of other organisations.

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evidence.²⁷ For example, DFID financed a UK Research Council project to develop a genetically modified plantain²⁸ which is resistant to attack by soil worms, called nematodes, which eat the roots of the plant. Plantain is the main subsistence crop for many Ugandan farmers and nematodes can reduce yields by up to 40%.²⁹ Since plantain reproduces by fertilising itself, the risks of the genetically modified material spreading in the environment are minimal.³⁰

Our Approach

1.20 This review focusses on investments made by DFID between 2003-04 and 2012-13 under the following initiatives:

- Renewable Natural Resources Research Strategy (RNRRS), 1995-2005,³¹
- Portfolio of Research in Sustainable Agriculture, 2006-10;³² and
- DFID's operational plan for the Agricultural Research Team of the Research and Evidence Division (RED), 2010-15.³³

Selected projects

1.21 We examined in detail seven projects, which are described in Figure 5 and Figure 6 on page 7. These include large, medium and small projects and cover all types of research and delivery channels. We included one recently completed project, the Research into Use project. This was the first major DFID project to develop and test new ways to make research outputs widely

available to farmers. We also reviewed the wider portfolio to inform our analysis.

Figure 5: Project descriptions

The following seven projects were examined in more detail:

CGIAR, the Consultative Group on International Agricultural Research, is a consortium of 15 global agricultural research centres. It researches all the main food crops and farming systems in developing countries. It is supported by most major donors, including DFID, through the CGIAR Fund, which is administered by the World Bank.

BBSRC, the Biotechnology and Biological Sciences Research Council, is a UK research council. DFID co-finances four advanced science projects with BBSRC. Projects are implemented by UK universities. We will refer to this overall DFID project as the **UK Research Council**.

AATF, the African Agricultural Technology Foundation, facilitates public/private partnerships to ensure that appropriate proprietary agricultural technologies³⁴ reach smallholder farmers in Sub-Saharan Africa. DFID has supported AATF since it was established in 2002. We will refer to this project as **African Technology**.

ICIPE, the International Centre of Insect Physiology and Ecology, is the only international research centre working primarily on insect-related challenges of food security in Africa. It focusses on vector-borne diseases of people and livestock. We will refer to this project as **African Insect Science**.

GALVmed, the Global Alliance on Livestock Veterinary Medicines, is a not-for-profit organisation. It aims to create sustainable solutions to livestock diseases by developing animal health vaccines, diagnostic tools and medicines. DFID has supported GALVmed since 2005. We will refer to this project as the **Global Animal Vaccines**.

HarvestPlus is a CGIAR programme, implemented by the International Food Policy Research Institute (IFPRI), which aims to breed higher levels of micronutrients directly into key staple foods and make these widely available. The International Centre for Tropical Agriculture (CIAT) is co-convenor of HarvestPlus.³⁵

Research into Use is a DFID project to promote the uptake of previous DFID-funded research outputs and to develop new market-based approaches to get research into use.

²⁷ UK Government policy is summarised in:

www.gov.uk/government/policies/making-the-food-and-farming-industry-more-competitive-while-protecting-the-environment/supporting-pages/genetic-modification.

²⁸ Plantain plants are related to bananas and bear a similar fruit. Plantains are an important subsistence and cash crop in Uganda and some other African countries.

²⁹ M. Gill and L. Meagher, *Evaluation of the Sustainable Agriculture Research for International Development (SARID) programme*, University of Aberdeen, 2012,

www.gov.uk/government/publications/evaluation-of-the-sustainable-agriculture-research-for-international-development-sarid-programme.

³⁰ Common plantain is able to self-fertilise because it possesses both male and female reproductive organs.

³¹ *Evaluation of DFID Renewable Natural Resources Research Strategy*, LTS International, Edinburgh, June 2005,

<http://www.oecd.org/derec/unitedkingdom/35168885.pdf>.

³² *Proposed Portfolio of Research in Sustainable Agriculture Project Document*, DFID, 2006.

³³ *Operational Plan 2011-2015*, DFID Research and Evidence Division, DFID, June 2012,

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/67359/rsch-evi-div-2011.pdf. DFID refreshes the Operational Plan each year.

³⁴ Proprietary technologies are those owned by a company or public body.

³⁵ See: <http://www.ifpri.org/book-7953/ourwork/division/harvestplus>.

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Methodology

1.22 We undertook a portfolio review to assess DFID's overall approach to agricultural research. We then carried out a detailed analysis of the seven selected projects. We assessed objectives, design and delivery and focussed on whether these projects are likely to lead to improved food and nutrition security for poor people.

Figure 6: Examined projects in figures³⁶

Project title	DFID spending (£ millions)	Dates	Types of research ³⁷	Funding channel
CGIAR	120	2012-15	1-4	Multilateral trust fund
BBSRC (UK Research Council)	34.4	2006-17	1-2	Memorandum of Understanding
AATF (African Technology)	8	2010-14	2-3	Accountable grant
ICIPE (African Insect Science)	13	2011-15	1-3	Memorandum of Understanding
GALVmed (Global Animal Vaccines)	20	2005-17	1-3	Accountable grant
HarvestPlus	30	2012-15	2-3	Multilateral trust fund
Research into Use	42.5	2006-13	3	Competitive contract

1.23 We reviewed relevant DFID programme and project documents and also examined a range of other studies on agricultural research and food security. We undertook a review of the evidence DFID used to justify its investments.

1.24 We interviewed DFID's agricultural team on the design, implementation and evaluation of the programme and of individual projects. We also interviewed staff of partner organisations and third party experts. Interviews were conducted face-to-face and by telephone.

1.25 Interviews took place in the UK and Africa. In Kenya and Uganda, the review team interviewed, individually and in groups, over 100 farmers and other beneficiaries of the HarvestPlus, African Insect Science and Research into Use projects.

1.26 We also worked with a team of local researchers to conduct field research in HarvestPlus villages in Uganda and Research into Use villages in Kenya. The exercise had two aims: the first was to assess the sustainability of project impacts; and the second was to verify the reliability of earlier impact evaluations. The results of the field research are summarised in the Impact section (Figure 8 on page 19). The methodology is described in Figure A5 in the Annex. The field research team interviewed over 400 farmers and other stakeholders, including local government officials. Both these projects focussed on research uptake by farmers.

³⁶ Types of research are classified as follows: 1 = Advanced Science; 2 = Applied Research; 3 = Research Uptake; and 4 = Policy Research.

2 Findings

Objectives

Assessment: Green-Amber 

2.1 In this section, we examine the strategy behind DFID's agricultural research programme. We review the objectives and balance of the programme and the extent to which DFID co-operates with other donors in designing its research projects.

The overall programme is well balanced

The risk-reward ratio of the research programme is appropriate

2.2 We found that the agricultural research programme, taken as a whole, is generally well balanced. Approximately 75% of funds are currently spent on applied research and research uptake. Such projects involve taking technologies from private and public sector laboratories, developing products and making these available to farmers. They generally aim to deliver benefits to farmers in five to ten years. Most of these projects are medium risk, though some innovative projects with the private sector to develop new ways to deliver research projects to farmers may be higher risk.³⁸

2.3 Advanced science projects are generally high or medium risk. DFID currently spends about 15% of agricultural research funds on higher-risk advanced science projects. The aim is to generate a pipeline of new technologies for the future. It generally takes 15-25 years, from the start of an advanced research project, to deliver benefits to farmers.

2.4 DFID has recently increased its investment in advanced science research projects which are high risk but have a potentially high payoff. Approximately 10% of funding is spent on generating evidence and policy research.

DFID avoids duplication with the research of other donors

2.5 DFID co-ordinates its support effectively with other donors to avoid duplication and increase efficiency. For example, DFID and the Gates Foundation worked together on the design of their two projects with GALVmed (DFID's project was the Global Animal Vaccines project). They

also harmonised reporting procedures to make it easier for the alliance to manage the projects.

2.6 DFID is one of the largest donors to CGIAR. It co-ordinates well with other donors to CGIAR and is working with them to facilitate the process of reforming the organisation. DFID has also worked with other donors to establish a standard set of indicators to measure research programme performance more consistently.

DFID's project objectives are realistic and relevant but theories of change are not clearly articulated

Project objectives are well-founded

2.7 DFID's objectives for agricultural research are appropriately aligned to policy goals. DFID's Structural Reform Plan (SRP) outlines how DFID plans to deliver the Coalition Government's objectives for international development. The agricultural research programme aims to contribute to three out of six SRP priorities:³⁹

- **International commitments:** achieving the Millennium Development Goals on hunger and poverty (through bio-fortification of staple crops, grown and consumed by the poor in Africa and Asia);
- **Wealth creation:** increasing agricultural growth in the face of resource scarcity (through developing new agricultural technologies); and
- **Climate change:** facilitating adaptation and mitigation in agriculture.

2.8 Detailed plans, which set out how these priorities will be achieved, are included in the Research and Evidence Division's operational plan for 2011-15, which includes DFID's agricultural research programme.⁴⁰ The planned outcomes are shown in Figure 7 on page 9. The plan is refreshed each year, as a consequence of which the specific results reported (for example, which seeds or vaccines are delivered) may change.⁴¹ It

³⁸ This is because they involve new and untested ways of providing incentives to private firms to work with smallholder farmers.

³⁹ The six SRP priorities are: (1) international commitments; (2) value for money; (3) wealth creation; (4) Afghanistan, Pakistan, conflict and stabilisation; (5) role of women; and (6) climate change.

⁴⁰ *Operational Plan 2011-2015*, DFID Research and Evidence Division, DFID, June 2012, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/67359/rsch-evi-div-2011.pdf.

⁴¹ Other internal papers complement the Operational Plan. *Programme review and priorities papers* for the programme were produced in 2010 and 2011 and the paper *What are we doing to support innovation?* was produced in 2011.

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is a flexible document, which highlights priorities and gives some indications of directions of change. We note, however, that when the five-year operational plan for 2010-15 was formulated, DFID did not set quantified targets for the end of the plan period in 2015. Our view is that, without these, the operational plan cannot be used to assess overall progress.

- 2.9 DFID's programme comprises 16 projects.⁴² We reviewed seven of these projects and considered that they all have relevant objectives. We also found that the projects have realistic objectives, which should be achievable within the time and resources available. Most of the projects we reviewed aim to develop new agricultural technologies and products and make them available to all farmers.

Figure 7: DFID's operational plan's expected results

- New agricultural technologies to enable sustainable intensification of agriculture.
- New agricultural products to combat livestock disease.
- New ways to integrate agriculture, health and nutrition to improve the health and nutrition of the poor.
- High-risk, high-impact research into technologies to respond to resource scarcity.
- Better evidence on research uptake for wider spread of benefits.
- Better evidence on faster innovation.
- Better understanding of the threat of global zoonotic⁴³ diseases and possible responses.
- New tools and approaches to climate change adaptation and mitigation in agriculture.

- 2.10 The African Insect Science project, for example, aims – over five years – to develop new ways to control the African fruit fly, which can devastate the mango crop in many African countries.⁴⁴ The project builds on ICIPE's expertise. We judge that development of the new pest management methods is likely to be achieved within the project budget and timeframe.

- 2.11 The UK Research Council project uses advanced science to produce technologies which must be further developed by applied scientists into products for farmers. For example, a number of grants were given to university researchers to identify the genes responsible for resistance to various plant and animal pests and diseases. It proved feasible to complete these projects within the typical budget of approximately £500,000 over four to five years.

Theories of change are not clearly articulated

- 2.12 Theories of change⁴⁵ are important in all development projects.⁴⁶ They are especially important in research projects. This is because of the complex sequence of steps leading from the successful research project (for example, a new vaccine or seed developed) to improved livelihoods, food security and nutrition for intended beneficiaries. A good theory of change focusses attention on what needs to be done and by whom, at different stages, to achieve impact.
- 2.13 In our view, DFID needs to articulate better the steps that need to be taken to ensure that successful research results in impact for poor people. Comprehensive theories of change should be outlined in all project business cases. They should define the elements in the chain leading to impact and assess the risks associated with each step.
- 2.14 For the CGIAR funding, DFID has joined other donors in encouraging CGIAR to develop theories of change for all 15 of its major research programmes. DFID informs us that these have been submitted for review by the donors.
- 2.15 Although the DFID project documents for the seven projects we reviewed do discuss how project outputs (for example, new seeds) are expected to result in outcomes (for example, higher farm productivity), none provides a detailed theory of change or clearly articulates how these outcomes will lead to impact (for example, improved livelihoods) for intended beneficiaries.

⁴² Since 30 April 2013, the number of projects has increased to 20.

⁴³ The World Health Organisation defines zoonotic diseases as those that spread from animals to human beings and vice versa, see: <http://www.who.int/zoonoses/en/>.

⁴⁴ For details of the programme, see <http://www.icipe.org/index.php/plant-health/267-african-fruit-fly-program.html>.

⁴⁵ A theory of change defines the chain of activities required to bring about a given long-term goal.

⁴⁶ I. Vogel, *Review of the use of 'Theory of Change' in international development*, DFID Consultancy Report, 2012.

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2.16 Two of the seven projects we reviewed were approved before theories of change were introduced into DFID in early 2011.⁴⁷ The other five were approved after this date. One business case (HarvestPlus) has no theory of change; the others we judge to be weak.⁴⁸ We note that a theory of change diagram was included in the CGIAR business case after this was recommended by DFID's Quality Assurance Unit (QAU).⁴⁹ The other projects had budgets under £40 million and therefore were not reviewed by the QAU.⁵⁰

2.17 The UK Research Council project was designed without considering the funding needed to take successful research outputs to the next applied research stage. This has resulted in technologies which could benefit farmers remaining 'on the shelf'.⁵¹ Although DFID later offered BBSRC finance for follow-on activities, it has not yet taken this up.

2.18 While DFID cannot be expected to finance follow-up activities for all its successful projects, it should anticipate what is needed and be prepared to develop new projects to take successful research to the next stage where this is relevant. It should also facilitate links with potential organisations to finance such work. In this way, it would reduce the risk that its investments could be wasted.

Maximising benefits for poor farmers and women should be central to project design

2.19 It is not clear from DFID's operational plan whether the agricultural research programme aims to help all farmers or specific groups of farmers. For example, the needs of subsistence farmers – growing food for their families – differ from those of better-off farmers, who sell produce and may work as contract farmers for multinational firms. Men and women farmers may

also have different needs and priorities. Women tend to prioritise cultivation of food and other crops for their families, while men emphasise crops to be sold for cash, which is often spent in ways that do not directly benefit the family.⁵²

2.20 While most DFID business cases that we examined mention the importance of addressing the needs of poor farmers and women farmers, none of them analyses:

- the needs and priorities of different groups of men and women farmers;
- how farmers participated in the design of the project and will be involved in implementation;
- how to ensure that benefits will not be captured by traders and better-off farmers; or
- the likely impact of the project on different social groups and the trade-offs between winners and losers.

2.21 We analysed the extent to which the needs and priorities of different groups of farmers were taken into account in business cases. We also examined how far these groups were involved in the design, implementation and evaluation of DFID's agricultural research projects.

2.22 We found that only two projects, African Technology and Research into Use, did so adequately. The other DFID projects were not clear about the category or categories of farmers they were targeting. These other projects also did not involve farmers adequately in the research.⁵³ When researchers and farmers work together, it generally results in more effective and practical technologies, which are adopted more widely by farmers. It also increases the payoff to agricultural research.⁵⁴ Many farmers are experimenters and innovators and could play a key role in agricultural research.⁵⁵

⁴⁷ These were the Research into Use and African Technology projects.

⁴⁸ In the case of the UK Research Council projects (ZELS), Global Animal Vaccines and African Insect Science, outline theories of change were included in the business cases, which were little more than restatements of their logical frameworks.

⁴⁹ DFID Quality Assurance Unit Report. Support to CGIAR: Consultative Group for International Agricultural Research, 5 July 2012.

⁵⁰ The DFID QAU generally only reviews projects with budgets of £40 million or over.

⁵¹ The first UK Research Council project was the Sustainable Agriculture for International Development (SARID) project. It was completed in early 2013. DFID offered to provide funds to BBSRC for follow-up work. BBSRC told us that it did not have the human resources to undertake the work. Interview with senior BBSRC officials on 22 May 2013.

⁵² For example, on alcohol, tobacco and similar products, see World Bank Development Report 2012: *Gender Equality and Development*, World Bank, Washington D.C., 2012.

⁵³ Although the CGIAR project was in this group, 7 out of 16 of its research programmes did target specific groups of farmers and involved them in the programme.

⁵⁴ J. Farrington, *Farmer Participatory Research: Editorial Introduction*, Experimental Agriculture, Volume 24, 1988, <http://dx.doi.org/10.1017/S0014479700016124>.

⁵⁵ G. Conway, *One Billion Hungry – Can We feed the world?*, Cornell University Press, page 342, 2012.

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- 2.23 We also analysed the extent to which men's and women's needs and priorities are taken into account and how these two groups were involved in the design, implementation and evaluation of DFID's agricultural research projects. We found that only two projects, CGIAR and African Insect Science, did so adequately. These projects generally aim to involve women in research project design and implementation.⁵⁶ They also recognise that women have different needs to men, which should be taken into account. The other five DFID research projects reviewed (for example, Research into Use and Global Animal Vaccines) did not aim to involve women in the research or directly target women's priorities.
- 2.24 In our view, a good business case should assess likely impacts on different social groups. It should also discuss how intended beneficiaries will participate in the project. DFID's business cases for development projects generally do this. The DFID Zimbabwe Livelihoods and Food Security Programme,⁵⁷ for example, uses different strategies to target subsistence and market-oriented farmers. Each group participates in the project in different ways. This development project is similar to the research into use projects funded under the agricultural research programme. It illustrates how such projects can be designed to take account of the needs of different categories of farmers.
- 2.25 The senior staff of most agricultural research organisations are scientists. They do not always focus on how to target research to meet the needs of different groups of farmers. This should, thus, be an area of focus for DFID.⁵⁸ In the latest UK Research Council project on zoonotic diseases, for example, DFID has run training courses on these issues for scientists bidding for research grants.
- 2.26 In 2012, DFID's Research and Evidence Division commissioned a series of reports on gender. The findings of these studies have been integrated into a gender work plan and are feeding through to agricultural research projects.

The ultimate beneficiaries of the programme are not clear

- 2.27 It is not clear whether the overall aim of the agricultural research programme is to improve the food security and nutrition of farmers in rural areas or of poor people living in urban areas or both.
- 2.28 By 2035, over 50% of African people are expected to live in urban areas.⁵⁹ The urban poor, generally, buy rather than grow most of their food and want cheap prices. They are not concerned about who produces the food they need. It could be produced by small farms, large commercial farms or a combination of the two.⁶⁰
- 2.29 One argument DFID uses to support investing in agricultural research is that it will secure lower food prices for poor people.⁶¹ In the Asian Green Revolution, the productivity gains were such that small farmers could produce food profitably, despite low prices. It is not yet clear whether this will be possible in Africa or whether some combination of large- and small-scale farming will be needed. DFID needs to consider the implications of this in planning future phases of its agricultural research programme.⁶²

Insufficient attention is paid to environmental sustainability

- 2.30 The Government's 2011 Foresight Report highlighted the importance of the sustainable intensification of agriculture. It defined sustainable intensification as increasing agricultural productivity in ways which minimise adverse environmental impacts. It also emphasised the importance of conserving resources, such as soil and water, which are under increasing pressure in Africa and Asia.
- 2.31 Although sustainable intensification of agriculture is one of the objectives of DFID's operational plan (see Figure 7 on page 9),⁶³ it is not addressed adequately in the objectives of DFID's current agricultural research projects. Most of these aim to develop new technologies and products to

⁵⁶ We found that 11 out of 15 of the major CGIAR research programmes do so, while 4 do not.

⁵⁷ *Business Case: Zimbabwe Livelihoods and Food Security Programme*, DFID, 2013.

⁵⁸ See Figure A6, Recommendation 1, in the Annex.

⁵⁹ *World Urbanization Prospects: The 2011 Revision*, Highlights, 2011, http://esa.un.org/unup/pdf/WUP2011_Highlights.pdf.

⁶⁰ Another alternative would be to import from other countries.

⁶¹ DFID uses this evidence in most of its recent business cases, see for example the 2012 business case for CGIAR.

⁶² See Figure A6, Recommendation 2, in the Annex.

⁶³ This is also mentioned in the 2011 *Programme review and priorities paper*.

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increase productivity. Few assess how these can be integrated successfully into the farming system, while minimising adverse environmental impacts. The programme's emphasis on increasing farm productivity, therefore, needs to be complemented by research on how to minimise adverse impacts and make the best use of soil, water and other resources.

- 2.32 We analysed the extent to which environmentally sustainable intensification is integrated into each of DFID's research projects. We found that this was only done by African Insect Science and 5 out of 15 of CGIAR's research programmes. None of the other DFID projects did so. African Insect Science, for example, used biological methods to control insect pests of crops, such as the mango fruit fly, which would reduce future use of pesticides.⁶⁴ The five CGIAR research programmes recognised that conventional farming systems⁶⁵ can cause adverse ecological impacts. Such adverse impacts of conventional farming systems can include soil erosion, soil compaction, over-use and contamination of water resources and increased greenhouse gas emissions. The programmes also investigated how agricultural production can be scaled up in environmentally sustainable ways, including low-tillage systems and agronomic interventions.

Delivery

Assessment: Green-Amber 

- 2.33 This section examines DFID's delivery of the agricultural research programme. We assess whether DFID has chosen the correct delivery channels and whether DFID has managed the agricultural research programme effectively. We also review the strength of DFID's financial management arrangements and the extent to which value for money is being achieved.

DFID works with trusted partners on the basis of strategic alliances

The largest recipient of DFID's agricultural research expenditure is CGIAR

- 2.34 DFID has funded CGIAR since its foundation in 1971. CGIAR is the primary international

research organisation on agriculture in developing countries. With funding from donors expected to reach £1 billion in 2014, CGIAR is a major contributor to agricultural research for development. There is substantial evidence on the impact of CGIAR's research on improved food security and nutrition. By channelling funding to research centres around the world, CGIAR works to ensure that its research has global reach and impact.

- 2.35 DFID has spent just under half of its agricultural research budget through CGIAR since 2008. It provided 9% of total donor contributions to CGIAR between 2006 and 2012.⁶⁶ DFID is able to leverage its position as one of the largest donors to shape CGIAR's research and reform agenda. It is an influential and proactive member of the CGIAR Fund Council. For example, DFID has driven the introduction of performance-based management in CGIAR, which resulted in the introduction of CGIAR's Strategy and Results Framework (SRF).⁶⁷ DFID was also influential, together with the World Bank, in encouraging CGIAR to introduce an open access policy⁶⁸ on data and information to increase transparency.
- 2.36 DFID uses a variety of funding channels to deliver its programmes (see Figure 4 on page 5). DFID provides unrestricted and strategic funding to CGIAR, which is channelled through an intermediary financial instrument administered by the World Bank. This is similar to a multi-donor trust fund, except that the World Bank does not accept fiduciary risk in managing the funds. The CGIAR Fund retains fiduciary risk. We have set out the flow of funding from DFID through the CGIAR consortium in Figure A1 in the Annex.
- 2.37 Because funding for CGIAR is pooled, it is harder to attribute results to DFID. Using a multilateral funding instrument, however, does have the advantage that it facilitates donor harmonisation and reduces management costs. It also strengthens DFID's ability to push CGIAR's reform agenda.

⁶⁴ By introducing the natural predator of the mango fruit fly.

⁶⁵ Conventional farming systems typically involve intensive tillage, which destroys the structure of the top soil and exposes the soil surface: low soil organic matter; poor crop diversification and sometimes excessive use of agrochemicals for plant nutrition and pest control.

⁶⁶ Data on donor contributions from the CGIAR Financial Reports, from 2006-12.

⁶⁷ The Strategy and Results Framework can be found at

http://consortium.cgiar.org/wp-content/uploads/2011/08/CGIAR-SRF-Feb_20_2011.pdf.

⁶⁸ On CGIAR's open access policy,

see <http://www.cgiar.org/consortium-news/a-roadmap-for-moving-cgiar-towards-open-access-a-major-milestone/>.

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2.38 Approximately 85% of CGIAR funds are used internally by its 15 research centres and research programmes. The remaining 15% is used to sub-contract other organisations. These include private firms and non-governmental organisations (NGOs) in developing countries, which CGIAR partners with to deliver research outputs to farmers. It also sub-contracts laboratories, mostly in Europe and North America, to undertake advanced research.

DFID spends much of the balance of its agricultural research budget through other international research organisations

2.39 DFID also funds other specialist research organisations addressing its research priorities, including food security, nutrition and delivering research outputs to farmers. It selects these other international research organisations without going through a process of open competition. We found DFID's choice of funding mechanism was generally appropriate given the limited choice of partners able to address specific research or innovation gaps.

2.40 DFID usually enters into a Memorandum of Understanding (MoU) with international organisations. In the case of African Insect Science, the MoU includes a 20% performance-based funding to incentivise good performance and efficiency. DFID uses accountable grant arrangements with smaller non-profit organisations, such as in the Global Animal Vaccines and African Technology projects, to ensure regular oversight of progress.

2.41 DFID also uses its funding and influence to establish and support research partners to address a specific priority. For example, DFID set up GALVmed (DFID's partner in the Global Animal Vaccines project) to develop public-private partnerships to carry out research and development projects to help poor livestock keepers.⁶⁹ It also established the AATF (DFID's partner in the African Technology project) to focus on making important technologies (owned by public and private organisations in Australia, Europe and North America) available in developing countries. DFID continues to support both organisations.

2.42 Research into Use is the only one of the seven projects where DFID used competitive processes to select the managing agency. In this case, DFID was able to procure competitively, due to the wider choice of potential organisations with the experience needed to manage such a project. The Research into Use project aimed to test alternative ways to deliver to farmers the technologies developed through earlier DFID-funded research.

2.43 DFID research partners vary in the extent to which they work with sub-contractors to implement their research projects. The African Technology (see Figure A2 in the Annex) and Global Animal Vaccines projects both work with many research organisations, NGOs, government departments and private sector firms. Some of these involve sub-contracts, while others are based on shared interest and do not involve payment. The UK Research Council uses competitive commissioning processes to sub-contract research to universities and other research organisations. The African Insect Science project, like CGIAR, spends most of its budget internally but is building partnerships to deliver research outputs to farmers.

DFID does not undertake systematic capacity assessments of its partners

2.44 There is evidence in DFID's project documents indicating that it selects its partners carefully. It takes account of the partners' alignment with DFID's priorities and their capacity. For example, the HarvestPlus programme was assessed to be effective in tackling under-nutrition through bio-fortification of crops and was judged to be well managed.

2.45 Despite this, DFID does not undertake systematic capacity assessments of its partners. It takes the view that it does not need to do this where a partner is identified who is able to co-fund and manage the research.

2.46 We take the view that this approach introduces the risk that DFID may overestimate a partner's capacity and invest in it, where using an open and competitive selection process would lead to working with a more suitable partner and better impact for the intended beneficiaries. For example, DFID approved £5 million additional

⁶⁹ GALVmed Submission Phase 1, DFID, May 2005.

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funding to African Insect Science, mainly based on self-reported assessments of impact, rather than external validation of the organisation's results. DFID informs us that it also based its decision on an independent external review commissioned by the ICIPE Board, which included its African Insect Science project – but this is not referred to in its Business Case. Also, DFID did not perform a formal capacity assessment of the Gates Foundation before agreeing to contribute £30 million to a strategic collaboration, managed by the organisation.

- 2.47 DFID's 2011 Multilateral Aid Review⁷⁰ did not include CGIAR. In deciding whether to continue funding CGIAR, DFID drew on the Australian Government's 2012 assessment of multilateral agencies, which did include CGIAR. It recommended that CGIAR should be reformed to make it more effective and to improve value for money.⁷¹ The CGIAR reform is in progress and has already seen improvements. For example, there has been a reduction in overhead at CGIAR centres, from 20% in 2007 to 16% in 2011.⁷²

We found examples of DFID's partners using competitive procedures

- 2.48 Although most of DFID's partners are selected non-competitively, these partners generally use competitive procedures to select appropriate sub-contractors to undertake research. For example, the UK Research Council selected researchers for its joint research projects by inviting bids. These were then assessed by a peer review process, using research excellence and development criteria.⁷³ DFID is also encouraging the use of competitive processes to commission large-scale impact evaluation studies. The Research Into Use project used an open two-stage competition in selection of grant recipients which included a presentation as a part of the selection process. Many UK universities have won contracts competitively from CGIAR research programmes.

⁷⁰ *Multilateral Aid Review*, DFID, March 2011, www.gov.uk/government/publications/multilateral-aid-review.

⁷¹ *Business Case and Intervention Summary, Support to CGIAR*, DFID, <http://projects.dfid.gov.uk/iati/Document/3717528>.

⁷² *Financial Report 2011*, CGIAR, Table 4, page 11, http://library.cgiar.org/bitstream/handle/10947/2707/2011_CGIAR_Financial_Report.pdf?sequence=1.

⁷³ In competitive procedures, a supplier is selected through a bidding or proposal process. The objective of using competitive procedures is to ensure transparency in procurement and to select the most competitive bid.

DFID manages the delivery channels well

- 2.49 We found that DFID's agricultural research team managed the delivery of the programme efficiently. It comprises 12 full-time members and one part-time staff member.⁷⁴
- 2.50 We found that DFID manages its partnerships effectively. DFID has put in place monitoring and reporting mechanisms to ensure that it receives the information it needs on the performance of partners. This is especially important when DFID provides core funding, as is the case with CGIAR and African Technology.
- 2.51 DFID has been at the forefront of donor efforts to harmonise CGIAR's standard reporting format and to hold CGIAR to account. DFID's partners view DFID as an involved donor, one stating that 'DFID is a tough but supportive friend'.
- 2.52 We also saw evidence of DFID taking robust action when research projects do not deliver as expected. For example, DFID changed the managers of the Research into Use project, due to inefficiencies, including slow decision-making, which delayed the implementation of the project. Following the changes, the rate of progress and value for money improved. DFID also stopped funding to Crops for the Future because of weak organisational capacity.⁷⁵

The financial management capacity of DFID and its partners is strong

- 2.53 In the agricultural research programme, funds flow primarily to partner institutions, not to intended beneficiaries. The risk of funds not being managed appropriately is thus confined mainly to partner organisations. The exception to this is when products or approaches are being piloted in the field. An example of this is the work of Farm Input Promotions Africa Ltd., as part of the Research into Use project, which piloted a new approach to private farmer advisory services.
- 2.54 We found evidence that DFID robustly monitors partners' expenditure against budget and milestones. It does this through regular financial reporting on expenditure and narrative reporting

⁷⁴ A team leader, a research manager, four advisers and six deputy programme managers or support staff and one half-time adviser (on 23 September 2013).

⁷⁵ Crops for the Future, formerly called the International Centre for Underutilised Crops. This was funded through DFID's Support to International Agriculture Research Centres that Benefits Poor People (2011-15).

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on progress. DFID's programme management team has also visited partners in the field to conduct detailed checks on expenditure, when necessary.⁷⁶

- 2.55 It was clear that DFID's partners on the seven projects we reviewed had strong financial management systems and arrangements in place to hold their sub-contractors accountable. For example, we saw evidence of DFID's partners commissioning audits of sub-contractors, visiting the field and dealing swiftly and effectively with any identified fraud. This is particularly important for the Research into Use and African Technology projects, which work primarily with sub-contractors.⁷⁷ CGIAR has developed a set of financial guidelines, with which research centres must comply to ensure good financial health. These are being updated and reviewed regularly, as part of the reform process.

DFID uses its resources effectively to leverage funds and reduce administration costs

- 2.56 DFID works well with other donors to leverage funding and reduce administration costs. Because funding to CGIAR is provided through a multilateral pool, DFID is able to work with other donors to set strategic research priorities and reduce costs. We also saw evidence of DFID channelling funds strategically to maximise impact. For example, DFID's core funding to the AATF (the African Technology project) has allowed the organisation to build its capacity and strengthen its systems. This has enabled it to attract funding from other donors.
- 2.57 We found that DFID co-operated with the Gates Foundation on several projects to improve efficiency. For example, DFID and the Gates Foundation worked together to align their management and reporting requirements for GALVmed (the Global Animal Vaccines project), thus reducing administration costs. We also saw examples of DFID saving costs by using managing agents. For example, the UK Research Council provides high-quality research

management at low cost on the programmes it co-funds with DFID. The Swiss Agency for Development and Cooperation administers DFID's funding to the African Insect Science project and provides an annual report on its financial position, at no cost to DFID.

- 2.58 DFID's Research and Evidence Division is currently reviewing its partners' administration costs in order to improve value for money. It is working on a common definition of administration costs to compare different organisations. The agricultural research team is participating in the study.
- 2.59 One of the key aims of the CGIAR reform process is to increase efficiency by reducing administration costs. CGIAR has established a standard definition of administration costs, which is being used to compare the efficiency of different centres and drive value for money. Administration costs currently average 15-16% across the 15 centres.⁷⁸ CGIAR aims to reduce these costs in all CGIAR centres to 13% or less.⁷⁹

Risk management needs further strengthening

- 2.60 DFID's agricultural research team has recently introduced more systematic analysis of project risks in its business cases and annual reviews, in line with DFID guidance. In addition, the Research and Evidence Division maintains a risk register which identifies divisional risks. As yet, though, there is no systematic analysis of risk at the portfolio level across the agricultural research programme. This makes it difficult for DFID to assess accurately the overall level of risk in the programme. As the agricultural research programme grows, robust risk management will become increasingly important to ensure value for money is achieved.

⁷⁶ For example, in 2008, DFID had concerns about the way the Forum for Agricultural Research in Africa (FARA) was using funds, revealed during an annual review. It subsequently undertook a detailed review of the organisation's internal controls and financial documentation. As a result of this review, DFID decided to stop funding.

⁷⁷ Figure A2 in the Annex shows how DFID's core funding flows into the African Technology project and to AATF's sub-contractors.

⁷⁸ *Financial Report 2011*, CGIAR, Table 4, page 11, http://library.cgiar.org/bitstream/handle/10947/2707/2011_CGIAR_Financial_Report.pdf?sequence=1.

⁷⁹ *CGIAR Cost Allocation Guidelines*, Financial Guidelines Series, Nr. 5, CGIAR, December 2008 (Rev), http://library.cgiar.org/bitstream/handle/10947/5548/finguide5_2009.pdf?sequence=1. Financial Guideline Number 5 was updated in June 2013. This updated version of the guideline has not been published online yet.

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Impact

Assessment: Green-Amber 

2.61 In this section, we review the likely impact of DFID's current agricultural research programme. As well as considering evidence from the projects we reviewed, we have drawn on evidence from impact assessments of earlier support to agricultural research.

There is good evidence of impact from DFID's earlier support to agricultural research

Research is a long-term process

2.62 It can take over 20 years for the outputs of laboratory-based, advanced science research to benefit poor people. For example, IR-8, the Asian 'miracle rice' variety, was developed by CGIAR in the early 1960s but its full impact only emerged in the 1980s and 1990s, after it had been crossed with local rice varieties, suited to local contexts. In Bangladesh,⁸⁰ these varieties have doubled rice production over the last 30 years. This has helped the country to become largely self-sufficient in rice, despite a rapidly growing population.⁸¹

2.63 We found that other early DFID research investments (for example, the initial stages in the development of the East Coast Fever vaccine in the 1980s) laid the foundation for the successful uptake of new products by farmers today.

DFID's long-term support to CGIAR is producing results

2.64 Independent researchers have estimated that over 60% of modern plant varieties grown in developing countries have CGIAR ancestry. They also estimate that 30% of the yield increases in global crop agriculture between 1965 and 1998 were due to CGIAR varieties.⁸²

2.65 Research has further shown that, without CGIAR, world food production would have been 4-5% lower, world grain prices would have been 18-21% higher and 13-15 million more children would have been malnourished, especially in

South Asia.⁸³ Overall, these efforts have benefited virtually all consumers in the world. The poor have benefited relatively more so, since they spend a greater share of their income on food.⁸⁴

2.66 DFID has contributed to the success of this Green Revolution through its long-standing support to CGIAR and through specific projects, such as that on deep-water rice in Bangladesh in the 1980s.⁸⁵

2.67 Most of the positive evidence on the impact of agricultural research relates to the success of the Green Revolution in irrigated areas of South Asia. In this region, it contributed to widespread poverty reduction, averted hunger for millions of people and avoided the conversion of thousands of hectares of forests and rangelands into agricultural production.⁸⁶ Despite these positive impacts, the Green Revolution had unintended social and environmental consequences.

2.68 Although the Green Revolution has reduced poverty, through lower food prices, technologies often by-passed poorer farmers. This occurred because poorer farmers often did not have secure access to land and could not obtain the inputs (such as fertiliser, irrigation and credit) needed to grow improved varieties.⁸⁷ Women farmers and households headed by women were also found to gain less from the Green Revolution than men.⁸⁸

2.69 The unintended environmental impacts included over-use of water resources, soil degradation and chemical runoff which, in some areas, had serious environmental impacts beyond the areas cultivated. These environmental costs are recognised as a potential threat to the long-term

⁸⁰ R. Evenson, et al., *Rice Research in Asia: Progress and Priorities*. International Rice Research Institute, 1996.

⁸¹ M. Hossain, M. Bose and B. Mustafi, *Adoption and productivity impact of modern rice varieties in Bangladesh*, *Developing Economies*, Vol. 44(2), 149-66, 2006.

⁸² Renkow and Byerlee, *The impacts of CGIAR research: A review of recent evidence*, *Food Policy*, Volume 35, Issue 5, 391-402.

⁸³ R. Evenson and M. Rosegrant, *The Economic Consequences of Crop Genetic Improvement*. In R. Evenson and D. Gollin (Eds) *Crop Variety Improvement and Its Effect on Productivity: The Impact of International Agricultural Research*, 2003.

⁸⁴ P. Pingali and R. Evenson, *Handbook of Agricultural Economics*, North Holland, 2007.

⁸⁵ D. Catling, *Rice in Deep Water*, International Rice Research Institute, page 394, Manila, 1992. The UK support to deep water rice research in Bangladesh lasted from 1977-1989.

⁸⁶ P. Pingali, *Green Revolution: impacts, limits and the path ahead*, *Proceedings of National Academy of Sciences*, Vol. 109 (31), 31 July 2012.

⁸⁷ P. Hazell and L. Haddad, *Agricultural Research and Poverty Reduction*, Discussion Paper No. 34, FAO, 2001. In S. Mathur and D. Pachico, *Agricultural Research and Poverty Reduction: Some Issues and Evidence*, pages 43-58 CIAT, 2003.

⁸⁸ P. Pingali and R. Evenson, *Handbook of Agricultural Economics*, 2007.

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sustainability of the Green Revolution's success.⁸⁹

- 2.70 Asia has benefited more than Africa from CGIAR programmes. In Asia, in 1998, 82% of cultivated area was planted with improved crop varieties, compared to 27% in Africa.⁹⁰ This was mainly due to the late introduction of CGIAR research programmes in Africa and the time lag in breeding efforts for African crops, such as sorghum, cassava and millets – which are of greater relative importance to the African poor.⁹¹
- 2.71 Although there have been few rigorous studies on the impact of agricultural research on productivity in Africa, positive evidence of impact is now emerging. One study⁹² indicates that, in West and Central Africa, the area cultivated with modern maize varieties has expanded from 5% of the maize area in the 1970s to 60% in 2005. It also estimated that, since the 1990s, half a million people annually have moved out of poverty by cultivating high-yielding maize varieties.
- 2.72 Another study indicates that new CGIAR varieties of the common bean are grown on half the bean area in the eastern, central and southern regions of Africa, benefiting over five million farmers and their families. It also indicates significant economic impact from cowpea and cassava pest research in West Africa.⁹³
- 2.73 We reviewed the evidence which DFID used to justify its recent support to CGIAR. We found it to be mostly robust. We also found DFID's use of the evidence of impact to be accurate. DFID highlights the positive impact of the Green Revolution and deals thoroughly with the unintended environmental consequences. By contrast, we noted earlier (paragraph 2.19-20 on page 10) that DFID business cases do not discuss sufficiently evidence on the unequal distribution of benefits among different social

groups (such as better-off farmers, poorer farmers and agricultural labourers).

Evidence of impact from some research projects is less clear

- 2.74 We found that evidence on the impact of earlier DFID investments, in organisations other than CGIAR, is less strong. The independent evaluation of DFID's 1995-2005 research programme indicates that it had only limited impact. Few of its research outputs were widely adopted by farmers.⁹⁴ DFID initiated the Research into Use project, following the evaluation, to find ways to put earlier research outputs into use.
- 2.75 It is too soon for DFID to have evaluated all the projects in its current portfolio. Many of them were only initiated in the last two to three years. To date, DFID has commissioned evaluations of two of the seven projects we reviewed. One of these, an evaluation of the recently completed Research into Use project, concluded that four of the five pilot projects evaluated are expected to achieve impact in five to ten years. Two already demonstrated positive impacts on farmers.⁹⁵ We examined the evidence presented and broadly concurred with this view. DFID plans a series of further programme evaluations to assess whether projects have achieved their outcomes and what lessons can be learnt.

There are promising indications that DFID's current agricultural research could have positive impacts

DFID's current projects are mostly on track to achieve results

- 2.76 The long timescales in research make it difficult to estimate the future impact of DFID's advanced science work. Even if DFID's current laboratory-based research is successful, a complex series of steps will need to be followed before the new technology reaches intended beneficiaries. Despite these difficulties, it is possible to obtain some preliminary indications of the potential impacts of DFID's agricultural research programme. This is because the majority of

⁸⁹ P. Pingali and M. Rosegrant, *Confronting the environmental consequences of the Green Revolution in Asia*, International Food Policy Research Institute, Washington, D.C.

⁹⁰ R. Evenson, *Crop Varietal Improvement and its Effect on Productivity*. In R. Evenson and D. Gollin (Eds.), *Crop Variety Improvement and its Effect on Productivity: The Impact of International Agricultural Research*, UK, 2003.

⁹¹ P. Pingali, *Green Revolution: Impacts, limits and the path ahead*, Proceedings of National Academy of Sciences, Vol. 109 (31), 31 July 2012.

⁹² Alene et al., *The economic and poverty impacts of maize research in West and Central Africa*, *Agricultural Economics* 40 (5): 535-550, 2009.

⁹³ Renkow and Byerlee, *The Impacts of CGIAR Research: A review of recent evidence*, *Food Policy*, Volume 35, Issue 5, 391-402.

⁹⁴ *Evaluation of DFID Renewable Natural Resources Research Strategy*, LTS International, June 2005,

<http://www.oecd.org/derec/unitedkingdom/35168885.pdf>.

⁹⁵ P. Gildermacher and R. Mur, *Bringing new ideas into practice: Experiments with agricultural innovation*, Learning from Research Into Use in Africa, 2012, http://researchintouse.com/resources/Learning-RIU-Africa_book2.pdf.

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projects focus on applied research and on the delivery of new technologies and products to farmers. These projects have the potential to benefit poor people sooner than DFID's advanced science research.

- 2.77 We saw evidence that six of the seven projects which we reviewed are delivering clear and timely outputs, including products with the potential to be taken to scale.⁹⁶ One of the projects, African Technology, has successfully obtained a number of advanced technologies from private and public organisations in Europe and North America. It is tackling intellectual property and biosafety issues, adapting the technologies for use in Africa and partnering with a range of organisations and governments to deliver them to farmers. As an example of its work, the African Technology project is developing maize varieties and techniques to provide protection against a parasitic weed, using technologies from the company DuPont. Other examples include drought-tolerant maize and cowpea varieties for West Africa, resistant to serious pests.⁹⁷
- 2.78 Finally, we found that both studies used appropriate methodologies. The FIPS evaluation involved fewer farmers and used a simpler methodology than the HarvestPlus evaluation. This was appropriate for a small project, where results were needed quickly. The HarvestPlus evaluation was a large-scale, rigorous study,⁹⁸ which resulted in a series of peer-reviewed articles in academic journals. Most of these technologies address problems faced by all farmers – poor subsistence farmers growing food for their own families and better-off farmers, who also produce surplus for sale. Despite this, better-off farmers, who can afford to buy the new seeds or other products, are likely to benefit more from DFID's research than poorer farmers. Research should also address the needs of poorer farmers,

who generally cannot afford to buy expensive inputs.

- 2.79 Additionally, unless research in Asia and Africa explicitly addresses the needs of women farmers, they are unlikely to benefit as much as men.⁹⁹ Recent research indicates that, if women farmers had access to and control over the same resources as men, they could increase yields on their farms by 20% to 30%. In Africa, women farmers receive only 7% of agricultural advisory services and 1% of agricultural credit.¹⁰⁰ As was noted earlier (paragraph 2.23 on page 11), while most CGIAR research programmes focus on the specific needs of women, five out of six of the other DFID projects reviewed do not.
- 2.80 A second example of a project already having impact is the Global Animal Vaccines project, which has set up a facility in Malawi to produce a vaccine against East Coast Fever, a serious cattle disease. It is partnering with a new company, Sidai,¹⁰¹ to market it and other vaccines and veterinary medicines throughout Kenya. The vaccine is being adopted by dairy farmers and Maasai livestock herders and is reducing cattle mortality rates. There are, however, indications that better-off Maasai herders, with large cattle herds, adopt the vaccines more easily and benefit more than small herders.¹⁰²
- 2.81 We undertook field research to assess the impact of two DFID research projects. Both these projects were found to have had a generally positive impact on intended beneficiaries (see Figure 8 on page 19).

⁹⁶ The HarvestPlus project has only just started. The Research into Use project was completed in early 2013. In its last two years, it brought significant benefits to farmers through its various research uptake pilot projects, see: P. Gildermacher and R. Mur, *Bringing New Ideas into Practice: Experiments with agricultural innovation*, Learning from Research into Use in Africa, 2012, http://researchintouse.com/resources/Learning-RIU-Africa_book2.pdf.

⁹⁷ Pests include maruca, a pod borer. See 2012 African Technology Annual Report, www.aatf-africa.org/node/410.

⁹⁸ The evaluation involved baseline and endline surveys (in 2007 and 2009, respectively) and a sustainability-of-impact survey in 2011. It also used both quantitative and qualitative methods. See Figure A5 in the Annex.

⁹⁹ Beverly McIntyre et al., *Agriculture at a Crossroads: The Global Report*, International Assessment of Agricultural Knowledge, Science and Technology for Development, Washington D.C., 2009.

¹⁰⁰ *The state of food and agriculture: women in agriculture. Closing the gender gap for development*, United Nations Food and Agriculture Organisation (FAO) Rome, 2012, <http://www.fao.org/docrep/013/i2050e/i2050e.pdf>.

¹⁰¹ See: <http://www.sidai.com>.

¹⁰² K. Homewood et al., *Livestock health and socio-economic impact of a veterinary intervention in Maasailand: infection-and-treatment vaccine against East Coast fever*. *Agricultural Systems*, 89 (Issues 2-3), pages 248-71, 2006, <http://www.sciencedirect.com/science/article/pii/S0308521X05001903>. The research on the East Coast Fever vaccine was DFID financed and was undertaken in 2002-03

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Figure 8: Field research to assess impact on intended beneficiaries

We undertook our own assessment of the impact on intended beneficiaries of two of the projects we reviewed by carrying out village surveys. The projects were:

- **Farm Input Promotions Africa Ltd. (FIPS)**, a Research into Use project to test a model for providing advice on new technologies and agricultural inputs to farmers. This was relevant to poor farmers because government advisory services are generally ineffective and poor farmers find it difficult to access inputs. Our assessment of the project took place in western Kenya; and
- **HarvestPlus**, a project to test alternative ways to encourage farmers to adopt Vitamin A-fortified sweet potato. This was relevant to intended beneficiaries because Vitamin A deficiency is a significant cause of illness and impaired vision or blindness. It also increases mortality of young children.¹⁰³ Our assessment took place in eastern Uganda.

The Royal Tropical Institute (KIT), Amsterdam evaluated the impact of the FIPS project in 2012.¹⁰⁴ IFPRI evaluated the impact of the HarvestPlus project between 2007 and 2011. We assessed the robustness of findings from the earlier evaluations and estimated whether project impacts are likely to be sustained.¹⁰⁵

Overall, we found that both projects resulted in significant improvements in food security and nutrition for poor farming families. The HarvestPlus project explicitly targeted women and children. FIPS did not but most of its farmers were women. Both projects worked closely with communities but neither undertook a detailed process of social targeting, to ensure the poor were explicitly included. Our findings supported those of the earlier impact evaluations (see Figure A5 in the Annex).

Our work also supported two other key findings:

- effective uptake of research is not a straightforward process and takes time; and

- research uptake is best undertaken by research and development specialists working together. It needs the skills of both types of professionals.

These points are discussed in paragraphs 2.96 to 2.100 on pages 21-22.

In the case of HarvestPlus, for example, a number of problems arose during uptake. Some of these needed to be addressed by researchers (such as, the decline over time in yield of the new sweet potato varieties and their susceptibility to a virus attack). Other issues, such as generating awareness in urban markets of the nutrition and health benefits of biofortified crops, could have been resolved earlier in the project with inputs from development specialists. The programme could also have usefully established links with DFID's other development programmes in Uganda, especially on health and nutrition.

Neither project focussed on environmentally sustainable intensification. In expanding the coverage of these approaches, in future, HarvestPlus and FIPS could usefully test farming methods that minimise soil disturbance, maintain soil health and reduce the use of pesticides.

We found that both the HarvestPlus and FIPS projects would have benefited from greater external input in the design of the projects. NGOs in other parts of the world, for example, have tried to develop similar village-based adviser models and have experienced many of the same problems as FIPS. The key issue in all such schemes is how to make these models financially sustainable.¹⁰⁶

DFID sometimes did not anticipate the support needed to take successful research projects to the next step, limiting the impact

2.82 In the earlier discussion on theories of change, we noted that DFID has sometimes not anticipated the support needed to take successful research projects to the next step, thus limiting their impact (see paragraphs 2.12 to 2.18 on pages 9-10). This was the case in the UK Research Council project. We also found that CGIAR and some of DFID's other research partners are having difficulty working effectively with private sector firms and NGOs to get research into use. DFID cannot finance follow-on activities for all successful projects but it should ensure successful work is taken to the next level

¹⁰³ Meenakshi, J et al., *How Cost-Effective is Biofortification in Combating Micronutrient Deficiency? An Ex-ante Assessment*, 2010, World Development, pages 64-75.

¹⁰⁴ Gildermacher, P. and R. Mur, *Bringing New Ideas into Practice: Experiments with agricultural innovation*, Learning from Research Into Use in Africa, 2012, http://researchintouse.com/resources/Learning-RIU-Africa_book2.pdf.

¹⁰⁵ Alan de Brauw et al. *The Impact of the HarvestPlus Reaching End Users Orange-Fleshed Sweet Potato Project in Mozambique and Uganda*. IFPRI. 2010.

¹⁰⁶ For details on Cambodia's IDE Farm Business Advisers programme in Cambodia, see: <http://www.ide-cambodia.org/fba/>. This project was also funded under RIU. It was started one year before FIPS.

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by the best-placed organisation. It should also ensure that this is facilitated, where necessary.

- 2.83 On other occasions, we noted that DFID-financed successes were taken to the next stage by other donors. For example, DFID supported Farm Input Promotions Africa Ltd. (FIPS) to test its Village-Based Advisor model and helped to build the management capacity of the organisation. As a result, other donors (USAID and the Gates Foundation) are now financing further development and testing of the model. We found that research organisations are not always best placed to test uptake at scale and that closer links should be forged with public and private sector development organisations, possibly including NGOs.

Learning

Assessment: Amber-Red 

- 2.84 In this section, we assess how DFID monitors and evaluates the programme. We examine how lessons learnt are shared both within DFID and outside the organisation.

There is good evidence of learning and adaptation in the research programme

There are appropriate arrangements for project monitoring

- 2.85 DFID has put appropriate arrangements in place to monitor the progress of its projects. All projects have logical frameworks (that is, programme plans setting out objectives, activities and targets in a specific format). Annual reviews conducted by DFID staff monitor progress against these milestones and targets and make recommendations on how to improve project implementation.
- 2.86 We noted a number of cases where lessons from the annual review process had been used to refocus projects. DFID has reduced or withdrawn support to some projects because it considered that they were not providing value for money. For example, the grant to the African Enterprise Challenge Fund was reduced from £12 million to £6 million.
- 2.87 DFID's annual reviews use self-reporting by partners, supplemented by interviews with them. In 2012, DFID's Research and Evaluation Division issued guidance that annual reviews

could no longer depend solely on a desk-based review and DFID now requires these to feature inputs from outside the agricultural research team.

- 2.88 We found that DFID should visit its partners more frequently.¹⁰⁷ This, together with better evaluation systems and more third party reviews, would improve the information available to DFID in monitoring the progress of its projects.

Review arrangements are in place at the strategic level

- 2.89 We note that DFID has commissioned systematic reviews relating to the development of the programme, including the links between agriculture, health and nutrition. These reviews have been published in high-profile and widely read journals.¹⁰⁸ Systematic reviews have not been done on other important issues, such as environmentally sustainable intensification. The reviews are managed by the Systematic Review programme in the Evidence into Action Team of the Research and Evidence Division. External quality assurance and methodological support is drawn in from specialist organisations. Two senior academics from UK universities work for DFID one to two days a week, as senior research fellows. They give advice on the systematic reviews and keep DFID informed on other research evidence related to the programme. DFID informed us that it is currently considering a systematic review on the potential trade-offs between climate resilience, productivity and poverty alleviation in low-income countries, which will include issues around environmentally sustainable intensification.
- 2.90 In addition, the DFID Chief Scientist reviews the overall progress of the agricultural research programme every six months. While minutes of these meetings are taken, no report is produced.

DFID is undertaking rigorous impact evaluations to generate evidence on what works

- 2.91 DFID has recently partnered with two global centres of excellence to commission a number of impact evaluations. They are the Abdul Latif

¹⁰⁷ See Figure A6, Recommendation 4, in the Annex.

¹⁰⁸ E. Masset, et al., *Effectiveness of agricultural interventions that aim to improve nutritional status of children: Systematic review*, British Medical Journal, 17 January 2012.

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Jameel Poverty Action Lab (J-PAL)¹⁰⁹ at the Massachusetts Institute of Technology (MIT) and the International Initiative for Impact Evaluation (3ie).¹¹⁰ The two grants, totalling £7.7 million, will be used to collect evidence on how best to improve adoption and profitable use of agricultural technology by small-scale farmers in South Asia and Sub-Saharan Africa. In addition, DFID has embedded impact rigorous evaluations into some new projects such as HarvestPlus.

DFID's partners do not systematically or independently evaluate projects

- 2.92 Until recently, few projects were systematically evaluated making it difficult to assess impact. However, since 2010, DFID has placed increasing emphasis on the use of systematic, independent evaluation. Despite this, although DFID's partners monitor progress against milestones and targets adequately, three of the seven reviewed have yet to evaluate their DFID projects systematically or use independent third parties to assess their progress.
- 2.93 The projects yet to be evaluated systematically by DFID's partners are African Technology, African Insect Science and Global Animal Vaccines. DFID stated, in the relevant project documents, that these organisations would use DFID support to strengthen their capacity in evaluation. Despite this, in our view, none of these organisations has an adequate evaluation system yet.¹¹¹
- 2.94 CGIAR, generally, has better systems. Its evaluations are conducted by its research centres, its major research programmes or the Standing Panel on Impact Assessment (SPIA),¹¹² which reports to the Independent Science and Partnership Council. In the past, CGIAR relied mainly on internal evaluations but has started to reform its processes. An independent evaluation arrangement, based at the United Nations Food and Agriculture Organisation (FAO) in Rome, has been set up to ensure that good evaluation practice is embedded in CGIAR's research

programmes. The Institute of Economic Affairs (IEA) reports directly to the CGIAR Fund Council, on which the UK has a seat.

- 2.95 In our view, DFID's partners urgently need to strengthen their evaluation systems to generate robust evidence to improve performance and use in reporting to donors. Where appropriate, DFID should facilitate this process (for example, by connecting partners with centres of evaluation expertise).¹¹³

Research findings are disseminated well outside DFID but sharing of learning within DFID needs strengthening

- 2.96 DFID's research findings are disseminated effectively outside the organisation. Researchers from all seven projects have published articles in peer-reviewed journals and books. All partners have good websites with publications, reports and brochures available for download. The DFID partners that we interviewed reported that DFID actively encourages them to communicate their research findings and development results.
- 2.97 We found that transparency of information across the programme is high. DFID promoted the move to an open access policy in CGIAR and is doing the same with its other partners.
- 2.98 We found the sharing of research findings externally is good but learning within DFID requires strengthening. The agriculture research team works closely with the Food and Nutrition Security team and some other teams in the Policy Division. We interviewed a number of people in other departments (such as DFID's country programmes and Private Sector Department), most of whom told us that they have limited contact with the DFID agricultural research team and are not aware of its activities. The private sector development advisers whom we interviewed appeared unaware of the innovative work on research uptake being funded by the agricultural research programme.
- 2.99 Research uptake takes place at the interface of research and development. The agricultural research team is seeking ways to overcome market failure and stimulate the private sector to be involved in agricultural innovation. For

¹⁰⁹ Abdul Latif Jameel Poverty Action Lab, <http://www.povertyactionlab.org/>.

¹¹⁰ See: <http://www.3ieimpact.org/en/>.

¹¹¹ We note that AATF (the African Technology project) does undertake economic assessments of impact prior to investing in research on different issues. None of these organisations has adequate systems for evaluating outcomes and impacts.

¹¹² Impact evaluations are undertaken by its Standing Panel on Impact Assessment. Evaluations are the responsibility of individual CGIAR centres and Consortium Research Programmes (CRPs).

¹¹³ See Figure A6, Recommendation 3, in the Annex.

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example, the AgResults project is testing ways to incentivise the private sector to serve small farmers more effectively.¹¹⁴

2.100 To make it more likely that these new approaches will be taken to scale and benefit poor people, it is important that learning is shared between research and development organisations. Currently, the agricultural research programme sees its role as generating new products and approaches that can be adopted by all development programmes. While this is sound, we consider that there is scope for it to work more closely and in a more integrated way with DFID's other central departments and its country programmes.¹¹⁵ Research uptake is a process which is best undertaken by research and development specialists working together. It would also provide an opportunity to leverage the knowledge and financial resources of DFID's development programmes to improve food and nutrition security for large numbers of poor people.

¹¹⁴ *AgResults Innovation in Research and Delivery*, draft Concept Note is available at: http://siteresources.worldbank.org/CFPEXT/Resources/AgResults_concept_note.pdf.

¹¹⁵ There is also scope to work with development programmes, implemented by international organisations, such as the World Bank, to which DFID also contributes. These include the Global Agriculture and Food Security Program. See: paragraph 1.7, page 2.

3 Conclusions and Recommendations

Conclusions

- 3.1 DFID's agricultural research programme is effective and innovative. It focusses on developing new technologies and products and testing ways to deliver these to farmers. It works with leading agricultural research organisations to ensure that they deliver high-quality research and development outcomes for poor farmers.
- 3.2 The agricultural research programme has made a significant contribution to improved food and nutrition security for poor people in developing countries in the past and could do so in future. The challenge DFID faces is to scale up delivery to make the research outputs widely available to farmers in Africa and Asia. This will require the agricultural research programme and its partners to work more closely with private companies and governments.
- 3.3 The programme is well balanced with an appropriate mix of short-, medium- and long-term research. It has clear, relevant and realistic objectives. It is well managed by a lean and efficient team and is delivering against its objectives. Since the agricultural research programme is expanding, DFID should consider strengthening the team to ensure that the quality of the programme is maintained.¹¹⁶
- 3.4 The programme is responsive to changes in UK government policy and new evidence. It has started new initiatives and closed down or down-sized a few projects not delivering adequately. Recently, the programme has focussed increasingly on agriculture and nutrition and on developing innovative delivery mechanisms. It now also undertakes more high-risk and potentially high payoff advanced science research to develop the new technologies needed to feed the world in 20 to 30 years' time.¹¹⁷
- 3.5 DFID works well with other donors. It actively looks for ways to collaborate efficiently and avoid duplication. DFID is a champion of CGIAR reform and focusses strongly on results and value for money.

- 3.6 The programme would have a greater impact on DFID's overall objectives if it focussed more on the needs of poorer farmers, especially women farmers, and poor people in urban areas who need access to cheap food.

Recommendations

- 3.7 The following recommendations focus on the steps DFID should take to improve the programme to have greater impact for poor people.

Recommendation 1: DFID should ensure its agricultural research and development programmes collaborate better to deliver research outputs to farmers as quickly as possible and at scale to maximise the benefits for poor people.

- 3.8 DFID's agricultural research programme aims to generate new products and approaches which can be taken beyond the pilot stage to scale by any development organisation. The programme includes a number of innovative market-based projects, designed to stimulate the private sector to innovate and to find new ways to deliver new products to farmers at scale.
- 3.9 While this approach is sound, the agricultural research programme could have an even greater impact on poor people if it worked more closely with DFID's development departments and country programmes. By collaborating with other parts of DFID with experience in improving the livelihoods of poor people, research outputs could be taken to scale more effectively and more quickly. In this way, DFID could increase its impact on food security and nutrition for poor people in developing countries.

Recommendation 2: DFID should develop explicit theories of change to map out the steps and partnerships needed to ensure research outputs lead to improved food security and nutrition for poor people and women.

- 3.10 The agricultural research programme should develop robust theories of change for all its projects. These should identify what needs to be done, by whom, at each stage to achieve impact for poor people and women.

¹¹⁶ See Figure A6, Recommendation 5, in the Annex.

¹¹⁷ For example, DFID is investing with other donors in developing C4 rice, which aims to change the biophysical structure of the rice plant to make it a much more efficient user of energy from the sun.

3 Conclusions and Recommendations

- 3.11 While DFID cannot be expected to finance follow-up activities for all its successful projects, it should anticipate what will be needed to take successful research to the next stage where this is relevant. It should also facilitate links with potential organisations to finance the work. In this way, it would reduce the risk that its investments could be wasted and maximise benefits for poor people. DFID should proactively facilitate the process and ensure that research partners work effectively with development organisations to scale up research outputs quickly and effectively.
- 3.12 Linked to this, there is a danger that the technologies and delivery mechanisms being developed by DFID will mainly benefit the better-off farmers, often men, who are linked to markets. DFID's partners should ensure that their programmes also address the challenges poorer farmers and women farmers face and tailor their programmes accordingly.
- 3.13 DFID and its partners should therefore assess the impact of their agricultural research projects on specific groups of farmers and on women. The specific needs of these groups should be taken into account and they should participate in the design, implementation and evaluation of the projects, where appropriate. This will require DFID's partners to build their expertise in social impact analysis. DFID has strong capacity-building expertise in this area to facilitate this.

Recommendation 3: DFID should aim to increase agricultural productivity, while minimising negative environmental impacts. It should focus strongly on environmentally sustainable intensification of agriculture.

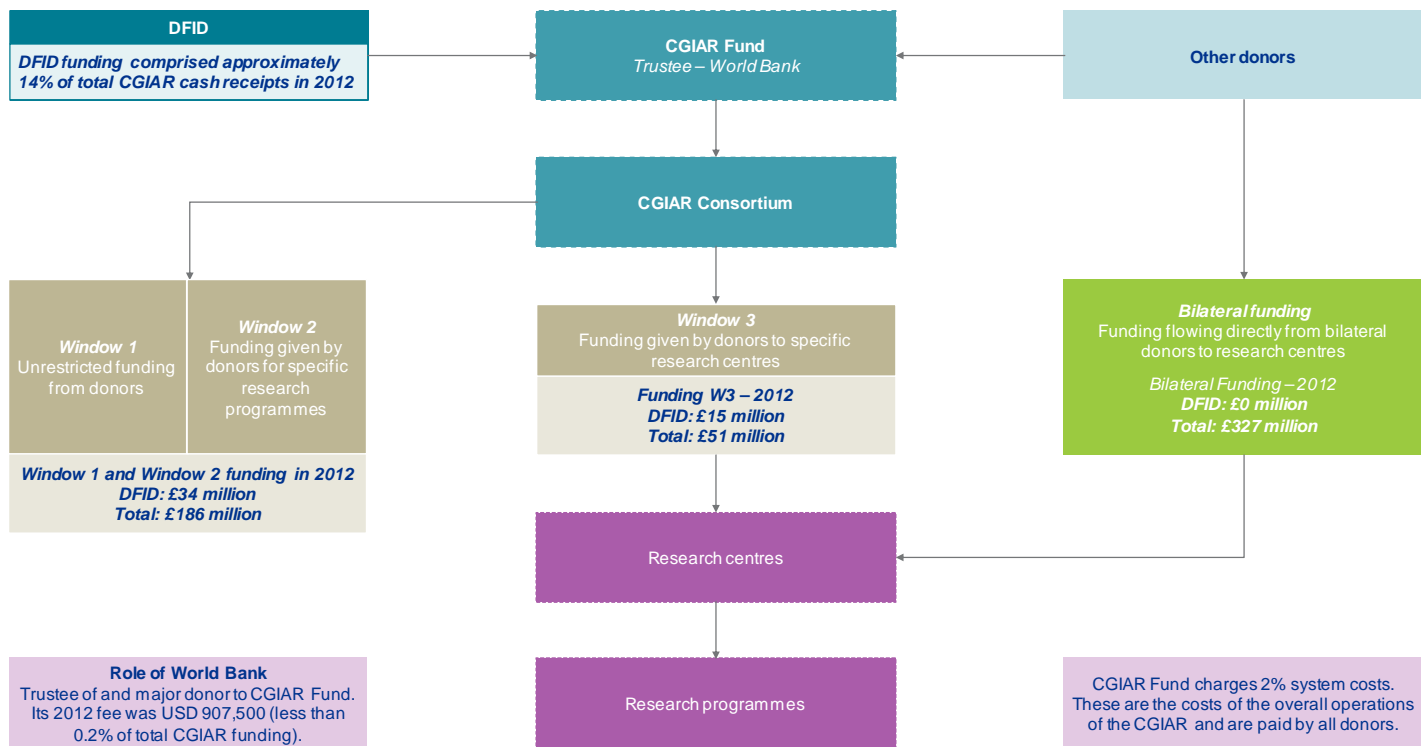
- 3.14 DFID's agricultural research programme is on track to deliver a number of new technologies and products which aim to increase agricultural output. It is important that these are integrated into farming systems in ways that will maximise overall productivity and minimise negative environmental impacts. Researchers and development specialists should work closely together to develop and test improved farming methods that minimise input use and land degradation.

Annex

1. This Annex provides more detailed background information to the review. This includes:
 - Figure A1: CGIAR funding flow;
 - Figure A2: the African Technology project – flow chart of AATF's programmes and partners;
 - Figure A3: DFID's agricultural research expenditure from 2003-04 to 2012-13;
 - Figure A4: DFID's agricultural research projects;
 - Figure A5: Impact assessment case studies;
 - Figure A6: Additional programme-level recommendations;
 - Figure A7: Bibliography; and
 - Figure A8: A list of consultations.

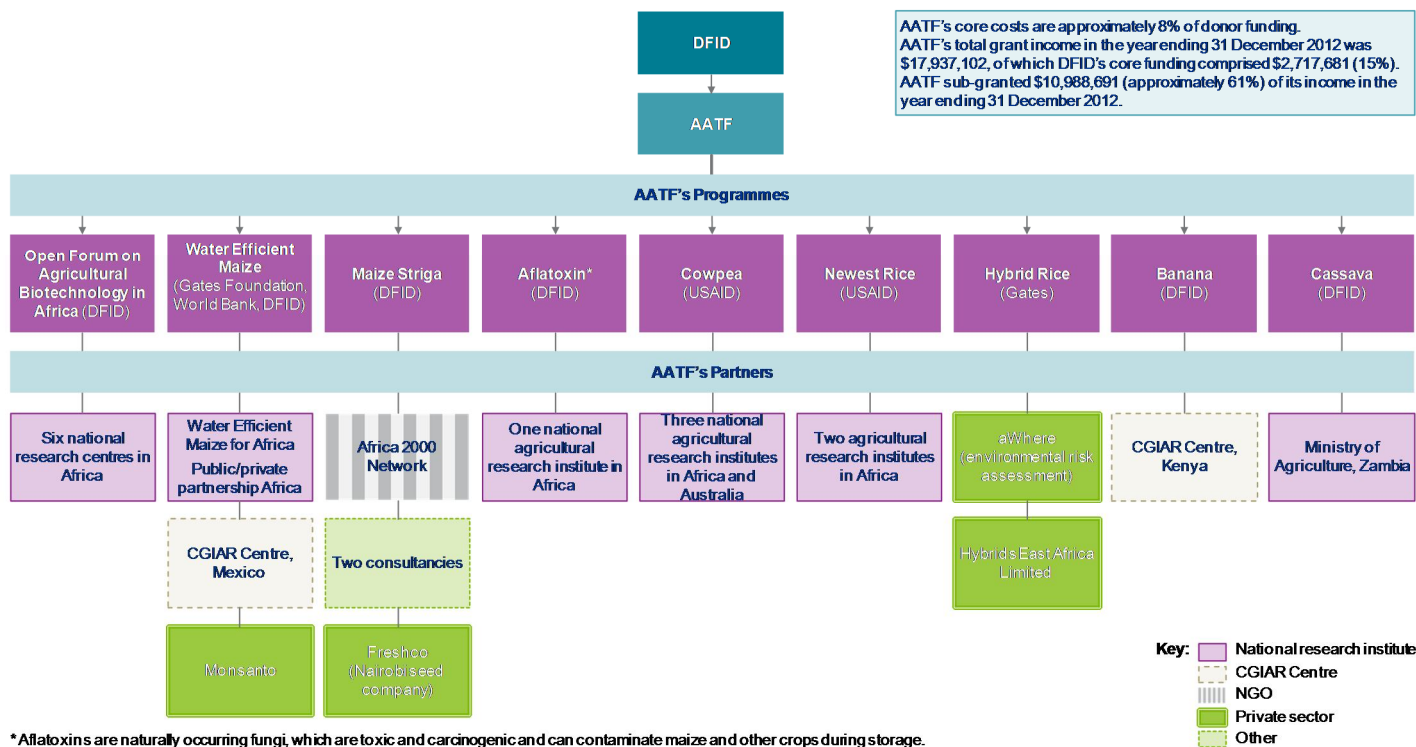
Annex

Figure A1: CGIAR funding flow



Annex

Figure A2: the African Technology project – flow chart of AATF’s programmes and partners^{118,119,120}



¹¹⁸ AATF's core costs found in: *Programme Memorandum*, African Agricultural Technology Foundation (AATF), Phase 2 of DFID Funding, 2010-2013.

¹¹⁹ AATF's grant income figures and sub-grants calculated from their 2012 financial report.

¹²⁰ List of partners is per AATF's 2012 financial report.

Annex

Figure A3 (a): DFID's agricultural research expenditure, 2003-13

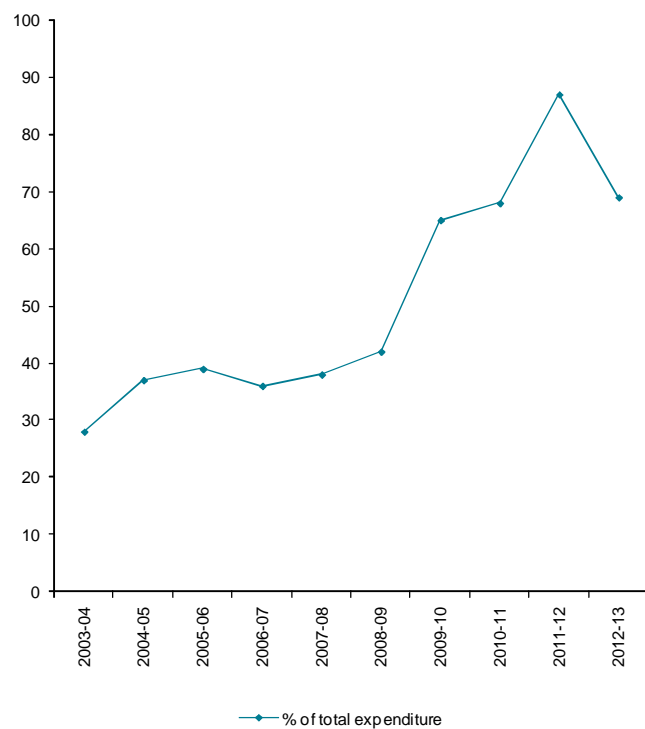
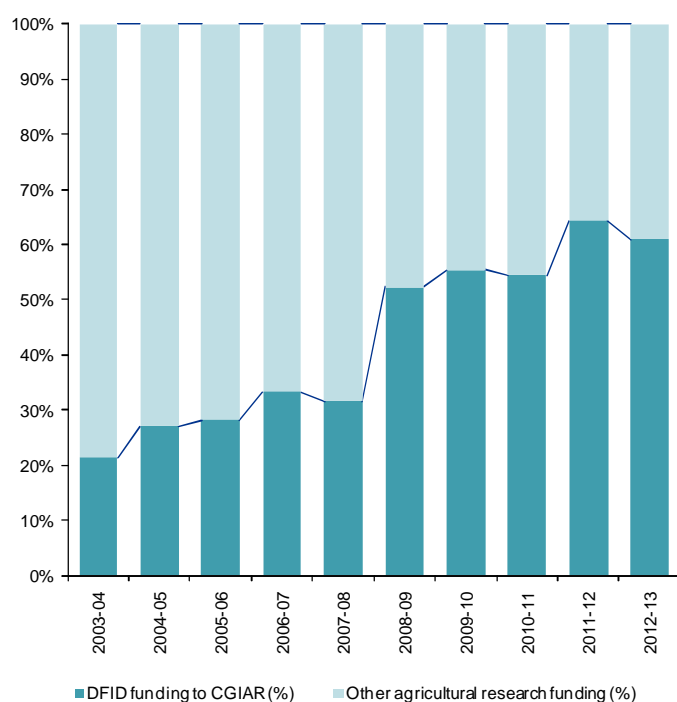


Figure A3 (b): DFID's funding to CGIAR as a percentage of DFID's total agricultural research expenditure, 2003-13



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Figure A3 (c): DFID's funding to CGIAR (in figures)

Year	DFID funding to CGIAR (£ millions)	Other agricultural research funding (£ millions)	Total (£ millions)
2003-04	6	22	28
2004-05	10	27	37
2005-06	11	28	39
2006-07	12	24	36
2007-08	12	26	38
2008-09	22	20	42
2009-10	36	29	65
2010-11	37	31	68
2011-12	56	31	87
2012-13	42	27	69
Total	244	265	509

Annex

Figure A4: DFID's agricultural research projects¹²¹ (on 30 April 2013)

The seven projects reviewed in detail are highlighted in bold.

	Project	Dates	DFID Cost £ million
1.	Support to the West and Central Africa Council for Agricultural Research and Development	2008-13	10.0
2.	Support to the Association for Strengthening Agriculture Research in East and Central Africa	2008-13	10.0
3.	Sustainable Agriculture Research for International Development (BBSRC)	2006-13	5.3
4.	Controlling African Animal Trypanosomosis (GALVmed)	2011-13	8.0
5.	African Agricultural Technology Foundation, Phase 2	2010-14	7.5
6.	Combating Infectious Diseases of Livestock for International Development (BBSRC)	2008-14	9.6
7.	Support to Consultative Group for International Agricultural Research (CGIAR)	2012-15	120.0
8.	Support to International Agriculture Research Centres that Benefits Poor People	2011-15	40.0
9.	Scaling up nutritionally improved food crops through HarvestPlus	2012-15	30.00
10.	DFID-Bill and Melinda Gates Foundation Strategic Collaboration Portfolio for Sustainable Intensification of Agriculture	2010-16	30.0
11.	African Enterprise Challenge Fund's Research into Business	2010-16	5.2
12.	Sustainable Crop Research for International Development (BBSRC)	2010-17	7.0
13.	Global Alliance For Livestock Veterinary Medicines (GALVmed): Protecting Livestock, Saving Human Life – Phase 2	2012-17	6.5
14.	Research Programme Consortium on Leveraging Agriculture for Nutrition in South Asia (LANSA)	2011-17	7.6
15.	Zoonoses and Emerging Livestock Systems: Reducing the Risk to Livestock and People (BBSRC)	2012-18	12.53
16.	AgResults - Agriculture Pull Mechanism Initiative (stimulating innovation in agricultural research and development)	2012-18	25.0
Projects that closed on 31 March 2013			
17.	Research into Use (RiU)	2006-13	42.4
18.	Future Agricultures Consortium	2010-13	1.5

¹²¹ Only projects over £1 million included.

Annex

Figure A5: Impact assessment case studies

Case study 1: Reaching the end users: Vitamin A-enriched sweet potato in Uganda

The HarvestPlus project encouraged farmers to grow and eat Vitamin A-enriched sweet potato. The project took place over 2006-09. HarvestPlus worked with NGOs and targeted 10,000 farmers in three districts in eastern Uganda.

The project tested two different approaches, a high-intensity, two-year model (Model 1) and a lower-intensity, potentially more cost-effective approach (Model 2). In Model 1, the high-intensity agricultural advisory services and nutrition education from the first year continued into a second year. In Model 2, these activities were scaled back substantially in the second year to provide cost savings and a basis for comparing cost-effectiveness with Model 1.

The project was undertaken by HarvestPlus under its regular research programme. DFID has provided core support to HarvestPlus since 2002 and, thus, has contributed to the cost of the project.

IFPRI evaluated the impact of the project. In 2007, it conducted a baseline survey of 1,500 farmers in 84 villages. It followed this with a survey at the end of the project, two years later. It used a randomised controlled-design evaluation.¹²² A qualitative study of the original households was also carried out.¹²³

IFPRI's results were positive and have been published in international scientific journals.¹²⁴ DFID used the IFPRI evidence to justify a new £30 million project with HarvestPlus (2012-15).

ICAI verification study

We conducted a survey in June 2013 to verify IFPRI's conclusions and assess the extent to which the impact of the project has been sustained.

We randomly selected 12 of the 84 IFPRI villages and conducted focus group discussions, interviewed health officials and traders and interviewed farmers who had been in the IFPRI study. Our two teams covered six villages each and spent two days in each village in June 2013.

We corroborated many of IFPRI's evaluation results:

- HarvestPlus distributed Vitamin A-enriched sweet potato vines to almost all farmers in 2007. We confirmed IFPRI's results that several farmers' group members faced problems with the quality of the vines. Additionally, members of non-farmers' groups reported difficulty in accessing vines and information on how to grow the new sweet potato varieties. Two years later, in 2009, 80-85% of farmers in two districts (Kamuli and Mukono) were still growing and eating the new varieties. In the third district, Bukedea, cultivation had fallen to under 40%. We confirmed that this was because farmers in Bukedea received the new sweet potato vines in the dry season. The new vines could not survive the drought and there was little left for subsequent years;
- IFPRI indicated that 52% of Model 1 and Model 2 farmers passed cuttings from the Vitamin A-enriched sweet potatoes to other farmers within the period from July 2007 to July 2009, which increased the impact of the project. We found that between one third and one half of these farmers sold or gave away cuttings;
- IFPRI reported increased nutritional knowledge of vitamin A sources among mothers. We found that women, representing 63% of respondents in all three districts, knew about the health and economic benefit of the Vitamin A-enriched varieties and were able to recall the names of these varieties; and
- we confirmed IFPRI's finding that women and children prefer the new varieties of sweet potato because they are sweeter and softer. Men prefer traditional varieties.

¹²² Farmers who had participated in Model 1 and Model 2 and those who had not been part of the project were randomly assigned to high-intensity groups, low-intensity groups and control groups, respectively.

¹²³ IFPRI also conducted a survey in 2011 to assess whether the positive impacts of the project were sustained. This has not been published yet.

¹²⁴ See, for example, C. Hotz et al., *A Large Scale Intervention to Introduce Beta Carotene Rich Orange Sweet Potato Was Effective in Increasing Vitamin A Intakes among Children and Women in Rural Uganda*, *Journal of Nutrition* 142: 1871-1880, 2012 and C. Holz, *Introduction of b-Carotene-Rich Orange Sweet Potato in Rural Uganda Resulted in Increased Vitamin A Intakes among Children and Women and Improved Vitamin A Status among Children*, *Journal of Nutrition*, 2012.

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IFPRI also took blood samples to assess the medical impact of the Vitamin A-enriched varieties on children's nutrition. We could not verify these findings, in the time available.¹²⁵

Our survey took place four years after the end of the project and made it possible to assess the long-term sustainability of project benefits. We identified a number of key issues for sustainability which HarvestPlus, DFID and other implementing agencies should take into account in expanding coverage in Uganda and other countries:

- Vitamin A-enriched sweet potato is susceptible to virus and pests. New vines need to be purchased every two to three years to maintain yield. If farmers are to continue growing these varieties, a local system is needed to ensure the supply of clean vines;
- the new enriched varieties do not store as well as traditional varieties and need to be sold soon after harvest. Currently, market demand is insufficient and needs to be stimulated. This will require links to be established with schools and a marketing and education campaign to take place in urban areas;
- the project could have worked closer with local government. Health service providers, the most trusted sources of nutrition information, were insufficiently involved in the project. Government health and agricultural staff are not yet sufficiently aware of the benefits for children of eating Vitamin A-enriched sweet potato; and
- current sweet potato farming methods are degrading the productive capacity of the soil. There is a need to adopt farming methods which minimise soil disturbance and maintain soil health (such as mulching). There is also a need to diversify cropping systems to achieve sustainable increases in productivity.

Lessons

For research uptake to work, researchers and development specialists need to work closely together, often for a number of years. The skills of both groups of professionals are needed, if products are to be delivered effectively to farmers and taken to scale. In this case, there was a need to involve the private sector (including local vine suppliers), as well as the public sector (including health and agricultural workers), in the process.

Case study 2: Village-Based Adviser model for farmers in western Kenya

This project aimed to test a new model of village-based advisors (VBAs), introduced by a private company - Farm Input Promotions Africa Ltd. (FIPS). The VBAs advise farmers on innovative agricultural technologies to boost their income. VBAs are 'paid' from the profit they earn by selling inputs to farmers.

The project was financed by DFID through the Research into Use (RiU) project. It lasted 18 months (2011-12) and cost £750,000. An independent evaluation was commissioned by RiU in 2012. It was one of a series of evaluations of RiU projects across Africa.¹²⁶

The evaluation team, from the Royal Tropical Institute (KIT), in Amsterdam, interviewed 83 farmers in 4 selected project villages and one control village. Farmers for interview were randomly selected in each village. The evaluation took place in July 2012.

ICAI verification study

We revisited the KIT villages in June 2013 to assess the impact of the project, one year after the KIT study. We also tested the robustness of KIT's findings.

Our four-person research team spent two days in each village and conducted focus group discussions and interviews with 50 farmers.

We corroborate KIT's findings. The project resulted in:

- **Higher productivity:** we found that the average yield of cassava, for example, rose from 93 tonnes a hectare before FIPS (2009) to 118 tonnes a hectare after FIPS (2012), an increase of 27%; and

¹²⁵ Verifying these results would have required a longer survey with inputs from medical specialists, which was not possible in the time available.

¹²⁶ P. Gildemacher and R. Mur. *Bringing new ideas into practice: Experiments with agricultural innovation. Learning from research into use in Africa: Overview*, KIT Publishers, Amsterdam, 2013.

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- **Improved food security:** of the farmers interviewed in project villages, 59% reported that food security had improved sustainably since the FIPS project, with maize, cassava and sweet potato consumption increasing by 68%. The food security situation in the non-FIPS village remained largely unchanged. The verification exercise observed that these benefits could be even higher if the benefits of diversifying farm enterprises and nutrition are considered. Farmers started growing a greater variety of crops, including groundnuts, cassava, maize, beans, sweet potatoes, millets, sorghums and vegetables, after FIPS interventions. Previously, they grew mainly millets, sorghum and cassava.

We also share KIT's doubts over the long-term sustainability of the VBA system. Selling seeds and marketing staple crops is unlikely to provide the margins needed to keep VBAs in business. Moreover, we found that farmers face difficulties in buying improved seeds and fertilizers; they are not linked to markets where they could sell higher-value products and are still not fully self-sufficient.

Lessons

Projects like this take longer to implement than the 18 months possible under the RiU project. Fortunately, this initiative has been taken forward by FIPS, with support from USAID. DFID could have facilitated links between FIPS and projects in other countries that have introduced such schemes, such as IDE in Cambodia.¹²⁷

¹²⁷ For details on IDE's Farm Business Advisors programme in Cambodia, see <http://www.ide-cambodia.org/fba/>.

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Figure A6: Additional programme-level recommendations

This table contains further recommendations on operational matters that have emerged from our evaluation. We do not expect a formal management response to these recommendations.

Issue	Recommendation
1. Many senior staff members in DFID's partner organisations are scientists. They do not always focus on how to target research to meet the needs of different groups of farmers. ¹²⁸	Organise training courses in social analysis for senior staff of partner organisations, similar to those run under the new UK Research Council project. ¹²⁹
2. By 2035, over 50% of Africa's poor will live in urban areas. The urban poor, in general, buy rather than grow their food and want low prices. It is not clear whether smallholder farming will be able to produce sufficient food, at a low enough price to meet demand. ¹³⁰	DFID should consider the implications of this in planning future phases of its agricultural research programme. A review should be commissioned to assess whether smallholder farming is likely to be able to meet future food security requirements in Africa, given the likely increase in urban growth and rural-urban migration.
3. Many of DFID's partner organisations lack adequate evaluation systems to generate robust evidence to improve performance and use in their reporting to donors. They also do not make sufficient use of independent third parties in assessing their progress. ¹³¹	DFID should support their partners to strengthen their evaluation systems. Where appropriate, DFID should facilitate this process (for example, by connecting partners with centres of evaluation expertise).
4. DFID's annual reviews rely mainly on the self-reporting of progress by partners. We found, on one occasion, that this was inaccurate and may have led to an inappropriate funding decision. ¹³²	DFID staff – or independent consultants working for DFID – should visit DFID projects annually to improve DFID's monitoring of project progress and its decision-making.
5. DFID's programme is expanding. This will put pressure on the small and lean team managing the programme. ¹³³	DFID should consider strengthening the agricultural research team to ensure that the quality of the programme is not adversely affected.

¹²⁸ See paragraph 2.25, page 11.

¹²⁹ Zoonoses and Emerging Livestock Systems: Reducing the Risk to Livestock and People Project.

See: <http://devtracker.dfid.gov.uk/projects/GB-1-202749/>.

¹³⁰ See paragraphs 2.27-2.29, page 11.

¹³¹ See paragraphs 2.91-2.94, on pages 20 and 21.

¹³² See paragraph 2.87, page 20.

¹³³ See paragraph 1.1, footnote 1, page 2 and paragraph 3.3, page 23.

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FIPS

Gildemacher, P. and R. Mur, *Bringing new ideas into practice: experiments with agricultural innovation. Learning from Research into Use in Africa, Overview*, KIT Publishers, Amsterdam, 2013.

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Figure A8: List of consultations

Location	Organisation	Beneficiaries
UK	DFID	
UK	DFID Research Advisory Group (leading academics)	
UK	Biotechnology and Biological Sciences Research Council	
UK	Global Alliance on Veterinary Medicines	
UK	Research into Use Programme	
UK	Academic - University of London	
UK	Academic – University of Cambridge	
UK	Academic – Rothamsted Research	
UK	Academic – International Institute for Environment and Development	
USA	CGIAR Fund Council	
USA	CGIAR Fund Council Secretariat	
USA	Harvest Plus	
USA	International Food Policy Research Institute (CGIAR)	
USA	Bill and Melinda Gates Foundation	
France	CGIAR Consortium	
Italy	CGIAR Independent Science and Partnership Council	
Italy	CGIAR Independent Evaluation Arrangement	
Kenya	DFID	
Kenya	International Livestock Research Institute (CGIAR)	
Kenya	World Agro-Forestry Centre (CGIAR)	
Kenya	International Crops Research Institute for the Semi-Arid Tropics (CGIAR)	
Kenya	African Agricultural Technology Foundation	
Kenya	International Centre of Insect Physiology and Ecology	50
Kenya	Africa Enterprise Challenge Fund	
Kenya	The Government of Kenya	
Kenya	Farm Input Promotions Africa Ltd	150
Kenya	Sidai – Tunza Mifugo Yako	
Uganda	HarvestPlus	350
Uganda	District government officials	
Total Beneficiaries		550

Abbreviations

3ie	International Initiative for Impact Evaluation
AATF	African Agricultural Technology Foundation
BBSRC	Biotechnological and Biological Sciences Research Council
CGIAR	Consultative Group on International Agricultural Research
CIAT	Centro Internacional de Agricultura Tropical, Colombia
CRPs	Consortium Research Programmes
DFID	Department for International Development
FAO	Food and Agriculture Organization
FARA	Forum for Agriculture Research in Africa
FIPS	Farms Input Promotions Africa Ltd.
G8	Group of Eight
GAFFSP	Global Agriculture and Food Security Program
GALVmed	Global Alliance on Livestock Veterinary Medicines
GMO	Genetically modified organisms
ICAI	Independent Commission for Aid Impact
ICIPE	International Centre of Insect Physiology and Ecology
IEA	Institute for Economic Affairs
IFPRI	The International Food Policy Research Institute
J-PAL	Abdul Latif Jameel Poverty Action Lab
KIT	Royal Tropical Institute
LANSA	Leveraging Agriculture for Nutrition in South Asia
MIT	Massachusetts Institute of Technology
MoU	Memorandum of Understanding
NAFS	The New Alliance for Food Security and Nutrition
NGO	Non-governmental organisation
ODA	Overseas Development Administration
ODI	Overseas Development Institute
OFSP	Orange-fleshed sweet potato
QAU	DFID's Quality Assurance Unit
RED	Research and Evidence Division
REU	Reaching end-users
RiU	Research into Use
RNRRS	Renewable Natural Resources Research Strategy
SARID	Sustainable Agriculture for Development
SPIA	Standing Panel on Impact Assessment
SRF	Strategy and Results Framework
SRP	Structural Reform Plan
USAID	United States Agency for International Development
VBA	Village-based advisors

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