

DOES RESEARCH REDUCE POVERTY?

**ASSESSING THE WELFARE IMPACTS OF POLICY-ORIENTED RESEARCH IN
AGRICULTURE**

Andy Sumner, Edoardo Masset and Rajendra Mulmi

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WORK IN PROGRESS

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For further information contact:
Caroline Davies
ALINe
Institute of Development Studies
University of Sussex at Falmer
Brighton BN1 9RE
C.Davies@ids.ac.uk

ACRONYMS

BFPP	Bangladesh Food Policy Project
BI	Bioversity International (formerly International Plant Genetic Resources Institute, IPGRI)
CIFOR	Center for International Forestry Research
CGIAR	Consultative Group on International Agricultural Research
FAO	Food and Agriculture Organization of the United Nations
FFE	Food for Education
ICARDA	International Center for Agricultural Research in Dry Areas
IDRC	International Development Research Center
IFPRI	International Food Policy Research Institute
ILRI	International Livestock Research Institute
IRRI	International Rice Research Institute
ITA	In-Trust Agreement
MOA	Ministry of Agriculture
ODI	Overseas Development Institute
POR	Policy-Oriented Research
PORIA	Policy-Oriented Research Impact Assessment
RRP	Rural Rationing Programme
SDP	Smallholder Dairy Project
WFC	WorldFish Center (formerly International Center for Living Aquatic Resources Management, ICLARM)

EXECUTIVE SUMMARY

In the current context of the global financial crisis and its aftermath, development resources are likely to be getting scarcer. Resources for development research are too. The set of circumstances generating the resource scarcity is also putting pressure on development gains. More than ever before, every dollar spent on development will have to count towards sustainable poverty reduction as will every dollar spent on development research. However, understanding the impacts of development research on policy change and on poverty is weak at best, with agriculture being no different.

The area of research impact is not a new area of enquiry but an emergent one. Our paper seeks to build on the work of others, notably, IFPRI, CGIAR, IDRC, ODI RAPID, GDN, NR International and ECDPM.

In our paper we survey the literature and identify different ways of assessing the impact of 'policy-oriented' research. We then take the available literature on agriculture as a specific focus to survey.

Our paper surveys the different types of 'policy-oriented' research; the literature on the 'theories of change' for policy research in international development; methodologies for analysing the impact of policy-oriented research; the relevant agriculture literature and outlines the types indicators that can be used for impact assessment of research with examples.

The key findings are:

- There is no standard practice for the evaluation of research projects and every evaluation strategy should be designed on a case-by-case basis.
- Provided we are willing to accept some assumptions, it is possible to test research project impacts along some dimensions of social welfare (agricultural output, income or poverty) by finding the appropriate indicators (and methodology). The overall goal - welfare impacts of research - is highly desirable but not always feasible (especially so due to time-lags).
- When a welfare assessment of research projects is not feasible, it is recommended that evaluators test intermediate project outcomes. The articulation of the theory of change of the project allows testing critical links in the causal chain running from research to welfare.

1. INTRODUCTION

In the current context of the global financial crisis and its aftermath, development resources are likely to be getting scarcer. Resources for development research are too. The set of circumstances generating the resource scarcity is also putting pressure on development gains. More than ever before every dollar spent on development will have to count towards sustainable poverty reduction as will every dollar spent on development research. The increasing relative importance of private donors in the funding of research is likely to accelerate this trend towards higher accountability. Efforts towards more accountability of research spending and impact assessment are highly desirable, because our understanding the impacts of development research on policy change and on poverty is weak at best, with agriculture being no different.

In this paper we survey the literature and identify different ways of assessing the impact of 'policy-oriented' research. We then take the available literature on agriculture as a specific focus to survey.¹

The area of research impact is not a new area of enquiry but an emergent one (see for example, Hovland, 2007). Our paper seeks to build on the work of others, notably, IFPRI, CGIAR, IDRC, ODI RAPID, GDN, NR International and ECDPM.

Our paper here,

- a) Surveys the different types of 'policy-oriented' research
- b) Surveys the literature on the 'theories of change' for policy research on international development
- c) Surveys methodologies for analysing the impact of policy-oriented research
- d) Surveys the relevant agriculture literature
- e) Outlines the types indicators that can be used for impact assessment of research and gives examples of monitoring and evaluation (M&E) for typical agricultural projects.

2. TYPES OF 'POLICY-ORIENTED RESEARCH'

What is 'policy-oriented research'? 'Policy-oriented research' has been defined in various ways but is essentially about research that has an audience beyond the academic community. Research is intended here as any activity that improves our understanding of the physical and social world as well as the interactions between this world and public policies (Nutley *et al.*, 2008). Policies are plans of action based

¹ The authors would like to thank in particular Lawrence Haddad and Johanna Lindstrom for important comments on several earlier drafts of this paper as well as Nicola Jones and Nick Perkins for on-going discussion through collaborations on research influence that have shaped and influenced this paper and our own thinking.

on principles and knowledge that are decided by a body or individuals in order to administer access to resources (Jones *et al.*, 2009).

Many researchers working in international development research seek to “make a difference” (Mehta *et al.*, 2006:1). Indeed, international development research is to a large extent about applied or instrumental research and is concerned with real-world problems (even when theorising). For example, a recent survey of 43 heads of development research institutes found that 88% saw the research community itself as an important audience, but 82% also said that policymakers in their own countries were an important audience (EADI, 2006: 6).

Definitions of international development research typically identify a commitment to instrumentality, as in Molteberg and Bergström’s (2000:7) proposition that:

[international development research] is research committed to improvement. Knowledge generation is not an end in itself... An implication of this is that [it] addresses current, actual problems, focusing on solving them – it tends to be applied and action – or policy-oriented.

In terms of the label ‘policy-oriented’ research Ryan and Kelly (2008:1) define such research as,

research aimed primarily at affecting choices made by governments or other institutions whose decision are embodied in laws, regulations, or other activities that generate benefits and costs for people who are affected by those governments or institutions.

Babu (2000: 4-5) develops this into two categories as follows:

The benefits of policy analysis research can be classified into two broad categories; pre-decision benefits and post-decision benefits. Before decisions are made, policy research information is useful in facilitating the decision-making process. These benefits can also be called process benefits. Process benefits include the benefits from strengthening the policy analysis units at various levels and creating additional capacity for policy analysis.²

Post-decision benefits of research consist of the impact of research once decisions have been made. Babu (2005: 5) further distinguishes between direct and indirect benefits of research:

² Babu continues (2000:4-5) ‘Process benefits can be realized even if the policy decisions are not actually made. This is particularly so when the research information helps prevent implementation of erroneous policy decisions. Such error-reduction benefits need to be counted in evaluating the impact of food policy research. Process benefits can be further categorized into quantifiable benefits and qualitative benefits. Quantifiable benefits are those which can be assigned a monetary value, although they tend to be subjective. Qualitative process benefits are those which cannot be directly quantified but can be represented in other terms, for example, the number of times a research report is used in the decision-making process, the role of the report in initiating dialogue, and the number of citations of the report in future research’.

For example, consider the results of policy research which suggests that the missing link between increased food security and child morbidity and mortality is the availability of clean water. Providing clean water to rural areas as a policy decision would have the direct benefit of saving children lives and the indirect benefit of saving women's time in fetching water from great distances.

In terms of specific definitions in the literature of research 'use' amongst the most cited are Caplan's and Weiss's definitions of research 'use' from the 1970s more recently Webber's definition as follows:

[f]or the most part, "use" is understood to mean "consideration" and has been measured by interview questions asking 'would you find this type of research helpful?' or 'have you considered this type of information when making a decision?' The exact process of use has been given different interpretations and little effort has been made to compare approaches to measuring knowledge use (Webber, 1991:5-6).

Weiss's (1977:531-3) seven meanings of research 'use' or research utilisation is well cited (see box 1).³ She noted,

[the] prevailing concept of research utilization stresses application of specific research conclusions to specific decisional choices. A problem exists; information or understanding is needed to generate a solution to the problem or to select among alternative solutions; research provides the missing knowledge; the decision makers then reach a solution... Data from three recent studies suggest that the major use of social research is not the application of specific data to specific decisions. Rather, government decision makers tend to use research indirectly, as a source of ideas, information, and orientations to the world. Although the process is not easily discernible, over time it may have profound effects on policy. Even research that challenges current values and political feasibilities is judged useful by decision makers.

These models can be used to explain impact and influence in different situations and are not mutually exclusive.

Box 1. Weiss's Seven Models of research utilisation

- *Knowledge driven*: a linear view that research findings may be communicated to create action;
- *Problem solving*: a policy-driven, linear view that begins with the end users of research & problems they face before tracking back in search of useful findings;
- *Interactive*: here the set of non-linear, less predictable interactions between researchers & users, with research influence/ impact happening through complex social processes of 'sustained interactivity';
- *Enlightenment*: this model eschews the notion that research influence/ impacts are simple and instrumental in effect; instead research is seen to effect change through 'the gradual sedimentation of insight, theories, concepts and perspectives';
- *Political*: research findings seen as ammunition in adversarial systems of decision making;

³ See Jones et al. (2009) for a conceptualisation of the use of research in the context of evaluation research.

- *Tactical* – research to be a resource to be drawn on whenever there is pressure for action on complex public issues, and may be used not just to bolster decision making but also to stall and deflect pressure for action.

Source: Weiss (1979)

Typically, 'use' is understood as either conceptual or instrumental use. Caplan (1979:462-4) defines instrumental use relating to micro-level decisions and conceptual use as relating to macro-level decisions:

associated with the day-to-day policy issues of limited significance [and that these] applications involved administrative policy issues pertaining to bureaucratic management and efficiency rather than substantive public policy issues and the later with important policy matters which affect the nation as a whole.

This demarcation between use/influence/impact/outcomes of instrumental versus conceptual research use/influence/impact/outcomes has survived. For example,

Non-academic research impact is about identifying the influences of research findings on policy, managerial and professional practices, social behaviour or public discourse. Such impact may be instrumental, influencing changes in policy, practices and behaviour, or conceptual, changing people's knowledge, understanding and attitudes towards social issues...research can contribute not just to decisional choices, but also to the formation of values, the creation of new understandings and possibilities, and to the quality of public and professional discourse and debate. (Davies *et al.*, 2005:11)

These definitions would suggest 'policy-oriented' research is (i) applied research (not 'basic' or 'fundamental' research); (ii) research that seeks to change policy (i.e. the primary audience is policymakers) and (iii) research that was designed and conducted with the explicit aim of producing policy recommendations to governments or other agencies.

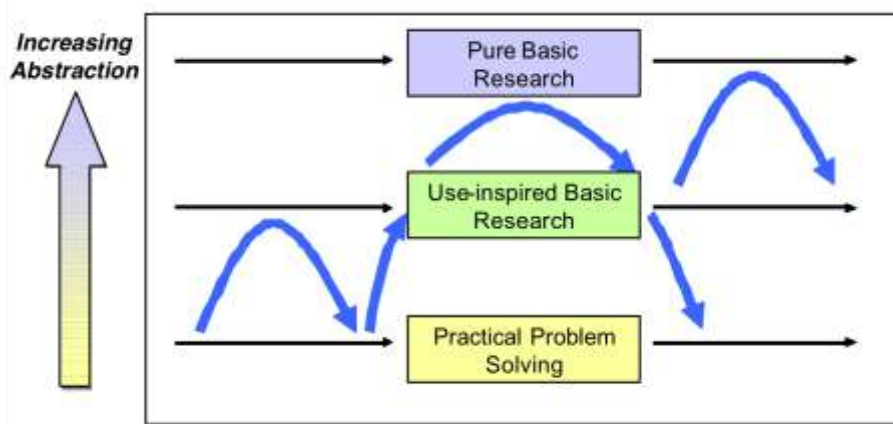
However, much of what might be labelled 'policy-oriented' research uses inputs from both basic and applied research. In short, the difference established between basic, or pure, research and applied research is blurred (Smith and Freebairn, 2004). This is more valid in social sciences and in agriculture where abstract theorising and modelling are not that common, and most research is conducted having in mind possible application.

Thus restricting any discussion of research impacts in agriculture to research that is applied, seeks to change policy and is explicit about its influence agenda, would miss much research that is 'policy-oriented'. For this reason we propose here a broader definition of 'policy-oriented' research instead. 'Policy-oriented' research is any research, whether applied or basic, where the audience is policymakers, and not only research that was designed and conducted with the explicit aim of producing policy recommendations to governments or other agencies. In short, 'policy-oriented' research is any research that can be potentially used by policymakers. This

broader definition of policy-oriented research will include for example the development of new crop varieties, the geographical study of soil composition, and the study of the living conditions of the rural poor.

In terms of linking use-orientation and policy research, Romer (2005:2) building on the work of Stokes (1997), refers to ‘an arc’, ‘that starts at the level of everyday experience, moves up to higher levels of abstraction, and then returns to the world of everyday experience’. Stokes (1997) concluded that we need more scientists like Louis Pasteur or ‘scientists who complete the arc by focusing on fundamental scientific inquiries that nevertheless have very immediate, practical, real-world applications’ (cited in *ibid.*, p. 2)

Figure 1. Romer’s Arc of Science



Source: Romer (2005:11)

Table 1 is a slightly modified version of Stokes’s (1997) ‘Pasteur’s Quadrant’. The Stoke’s quadrant is a two-by-two matrix which identifies three prototypes of research based on (1) whether research seeks fundamental knowledge, and (2) whether research is inspired by practical use. We simply substitute the column on ‘consideration of use’ in the original Stoke’s formulation with ‘types of use orientation’, which fits better with the present discussion on policy impact of research. The ‘gold standard’ for Stokes is then Pasteur, who made fundamental contributions to basic science while solving very practical problems.

Table 1. Types of ‘policy-oriented’ research.

Type of research – type of quest for understanding	Types of ‘use-orientation’ or extent of consideration of use	
	Explicit aim of producing policy recommendations i.e. use oriented	No explicit aim of producing policy recommendations i.e. not use oriented
Basic - explores fundamental relationships	‘use-inspired basic’ (e.g. Pasteur)	‘Pure-basic’ (e.g. Bohr)
Applied - explores operational relationships	‘pure applied’ (e.g. Edison)	X

Source: Adapted from Stokes (1997) and drawing upon discussion in Romer (2005).

3. THEORIES OF CHANGE FOR POLICY RESEARCH IN INTERNATIONAL DEVELOPMENT

3a. Theories of change

This section surveys the literature on the theories of change (TOCs) in policy or policy-oriented research on international development.

A TOC is,

like a road map. [it]...helps us to plot our journey from where we are now to where we want to be... [i]t helps us answer the question: What is the long term, sustainable social change we want to help bring about... [and] what needs to happen for the change to come about (Keystone, 2006:1).

A TOC has three components: First, a 'long-term vision of success' (ibid). Second, the 'preconditions of success' or 'all the priori changes that must happen if the vision of success is to be achieved' (ibid) and third, interventions 'that will produce those conditions' (Mackinnon and Amott, 2006:3).

3b. 'Vision of success'

In terms of international development research the ultimate 'vision of success' or overall goal is a welfare impact or an improvement of living conditions. Obvious indicators of living conditions are income, health and education, and the Millennium Development Goals are an example of welfare indicators for developing countries. Policy oriented research aims at raising welfare levels, changing the distribution of welfare in favour of disadvantaged sectors of the population, or reducing people's uncertainty regarding their future living conditions. However, an intermediate vision of success is policy change which is necessary but not sufficient for welfare improvements. There are several types of policy change. For example,

- a) Policy content change - Research evidence can lead to actual substantive change in the content of policy and/or resources allocated.
- b) Policy agenda setting - Research evidence can change policymakers priorities and draw attention to new issues or policy issues previously under-emphasised.
- c) Policy framing shift - Research evidence can change the way that policymakers understand a problem or the possible responses to it.
- d) Policy procedural change - Research evidence can change how policy itself is made by procedural/institutional change that leads to new actors or new evidence being part of the process of decision making.
- e) Behavioural changes in policy implementation - Research evidence change how policy is implemented.

Source: Jones and Sumner (2009).

There is neither hierarchy to these objectives nor are there causal relationships leading from one to the other. As a result, these policy impact objectives may overlap. For example, is the policy impact objective of abolishing a particular 'failing' programme a change in policy content or policy implementation?

Many cases studies (see below) are based solely on policy impacts as the 'vision of success' (and it is assumed welfare impacts follow) in others studies it is both policy impacts and welfare outcomes. In our survey we take policy change to be an intermediate vision of success and welfare improvements as the overall goal.

3c. 'Pre-conditions'

In terms of international development research the 'preconditions' to increase the likelihood of the above types of policy change being realised are numerous and we can identify many. For example, the existence of a networked policy research community, the openness and capacity of policymakers to evidence that does not necessarily confirm their own biases, the frequency of changes in context-planned events, political change or crises.

What determines 'policy-oriented' research or 'evidence' use by policymakers? There is, not surprisingly, a general acceptance among scholars and policymakers that research is not the sole source of influence on policy change. Policymakers have a wider context to consider and they have to 'invariably take politics, not just data into account' (Ryan and Garrett 1999:15). In addition, policymakers are guided by their own values and experience and by the need to make decisions on time with the resources that are available (Davies, 2005).

Research could be a substantial source of information for policymakers to base their decisions. It might or might not be the most important factor. What is important is the identification of factors that determine if research does or does not influence policy and under what conditions.

Court *et al.* (2005:169-170) argue that countries with greater democratic mechanisms and good governance (meaning accountability, transparency and responsiveness) are likely to use evidence more than others because of open and accessible public policy processes and autocratic regimes tend to limit the use of evidence. Jones (2005:6-7), contests this, noting that given the diversity across democracies a more nuanced analysis is needed including a range of components such as the presence or absence of multi-year national development strategies, to ideologically-driven or populist parties, to the degree of political and fiscal decentralisation, as well as the degree of stability and professionalism in the bureaucracy, degree of media and academic freedom, and the strength and roles of civil society, the relative openness to international discourses, and the relative novelty of an issue. Table 2 groups such factors to four key domains:

- *Policy capacity*: the level of capacity among policymakers, administrators and

the social society at large, in understanding research and acting upon the best information available.

- *Policy ideas/narratives*: the policy narrative/discourses/ideas and their underlying evidence or knowledge (i.e. power as discourse).
- *Policy actors/networks*: the policy actors and networks and their political interests and incentive/disincentive structures (i.e. power as material political economy).
- *Political context/institutions*: the context and institutions and how the socio-economic, political and cultural environment shapes policy processes and the formal/informal ‘rules of the game’ (i.e power as institutions or formal and informal ‘rules of the game’).

Table 2. What determines ‘policy-oriented’ research or ‘evidence’ use by policymakers?

Domains	Sub-domains
Policy capacity	Political processes that pass laws and hold the government accountable
	Extent of technical expertise among policymakers
	Level of bureaucracy professionalism and capacity to process evidence
Policy narrative and discourse(s)	Extent to which there is a consensus the nature of the problem and responses to the problem
	Extent of influence of international discourses on domestic policy and internalisation of debates
	Extent to which policy issue is novel
Policy actors and networks	Extent to which ruling party is ideologically driven
	Extent of ‘special interests’ (economic interests, unions, etc.) in policy issue
	Extent of strength of civil society
	Extent of influence of donors in policy making
	Role of ‘knowledge brokers’
	Presence of networks that promote information flows, knowledge sharing and communication between actors
Context and institutions	Level of democratic party competition
	Use of multi-year development plans
	Level of centralisation of political decision making
	Degree of academic and media freedom
	Strength of government leadership, interest groups and incentive structures in policy making organisations

Source: Based on literature review of Sumner and Harpham (2008). See also Annex I.

This could also be thought of in terms of the demand and supply of policy-oriented research or ‘evidence’. The factors that are likely to increase the supply of evidence are thus as follows: a greater influence of international discourses on domestic policy; a greater extent to which the policy is novel; a greater extent of professionalism in the bureaucracy and ability to process evidence; stronger civil society and donor influence; and greater extent or democratic openness and academic/media freedoms.

In contrast the factors that are likely to increase the demand for evidence are thus as follows: a greater influence of international discourses on domestic policy;⁴ a greater extent to which the policy is novel; a greater extent of professionalism in the bureaucracy and ability to process evidence; a stronger extent of donor influence; and the use of multi-year planning.

3d. ‘Interventions’

Third, in terms of international development research the ‘interventions’ in terms of the policy-oriented research are the activities researchers do to maximise research impact such as ‘packaging’ or ‘translating’ research for policy audiences, working through the networks; and scanning for opportunities (see table 3).

Table 3. What ‘interventions’ by researchers support the impact of policy-oriented research?

Factors	Characteristics
Networking	Researchers can work with civil society networks through strategic alliances; bring together researchers and policymakers at county level and internationally.
Messaging	Researchers can build credibility via publications; engaging research users in the process of knowledge generation itself; research with policy relevance as determined by policymakers; tying of messages to nationally and internationally resonate policy debates; policy briefs/synthesis/reviews to assist civil servants process evidence; focus on ‘what works’ in similar contexts.
Opportunism	Researchers can map upcoming ‘spaces’ for influence; for dominant policy narratives (and underlying evidence); for actors and networks of change/resistance (incentives, capacities and political interests).

Source: Based on literature review of Sumner *et al.*, (2009). See Annex II.

In terms of ‘networking’, we mean researchers connecting with ‘connectors’ or ‘champions’ and what Woods and Martinez-Diaz (2009) call ‘networks of influence’.⁵ Here we are referring to the importance to influence of building coalitions and networks or ‘knit working’. Such networks might include:

⁴ Though international discourse is not always based on evidence like for example the promotion of structural adjustment programmes or the privatisation of health care in developing countries.

⁵ ‘Connectors’ include the media, NGOs, information and communication technology, and communication teams within research institutes.

- ‘policy communities’ (networks of policy actors from inside and outside government which are integrated with the policy-making process),
- ‘epistemic communities’ (networks of experts with recognized/‘legitimized’ policy-relevant knowledge),
- ‘advocacy coalitions’ (groups of actors working on a specific issue/platform).

When we talk of ‘messaging’ we mean the *content and processes of knowledge generation and translation*. We are referring to the crafting of what Heath and Heath (2006) called ‘sticky messages’. These are wrapping research ideas in prevailing policy narratives or generating ‘stories’ (by mixing qualitative and quantitative research for example) that are not only memorable but credible and also adaptable via ‘translation’ for different audiences. For example, the RAPID project of ODI identifies four critical skills of the policy entrepreneur: being able to understand politics and identify key players; being able to synthesise research by simple compelling stories; being a good networker; and being able to build programmes that bring all these factors together. The Canadian Institute of Health Research (CIHR, 2009) have produced a knowledge generation and translation cycle model that includes synthesis, dissemination, exchange and ethically sound dissemination of knowledge.

By messaging we are also referring to the engagement and participation of users of research at the outset of research and during the research not just after the research is done. This approach is similar to an Innovation System approach to research which promotes interactions between knowledge producers and policymakers to encourage both communities to understand the challenges they each face to ensure knowledge generation is policy relevant.

In terms of ‘opportunism’ we are referring to the fact that influence and change often need a conducive environment in terms of context for influence or change to result. Researchers can search for windows of opportunity via strategic opportunism – the systematic identification of good opportunities to have an impact. Impact and change may be non-linearity, iterative and complex but opportunities are often visible before hand to those who know how/where to look. Finally, this is not to forget the major role serendipity plays in influence.

4. METHODOLOGIES FOR ANALYSING THE IMPACT OF POLICY-ORIENTED RESEARCH

There are three main reasons for assessing the policy impact of research (Nutley *et al.*, 2008). First, there are auditing and accountability reasons. We need to know whether a research project has had any impact on policy making in relation to its own targets. Second, impact assessments generate useful knowledge. By assessing the policy impact of specific research projects we learn about the determinants of success and failure, and we understand how the policy impact of future projects can be enhanced. Third, there are cost-effectiveness reasons. Once projects have been evaluated, their relative ability to produce impact can be compared to other types of interventions having similar aims but different costs.

However, the assessment of the policy impact of research projects poses a number of challenges. First, the impact of research takes place both in the short and in the long term. Since assessments are conducted shortly after project ends, many potential impacts of research go unnoticed. Second, research has a diffuse impact on policy making. Research may inspire actions in areas very different from the one initially targeted. This multiplies the number of potential effects and complicates the assessment of project success. Third, the impact of research is diluted in the policy process and its outcomes are hard to disentangle. In many cases the impact of the project is conditioned by the surrounding political environment to an extent that goes beyond the control of programme administrators. Finally, there is no obvious counterfactual available to measure impact. This is the most daunting of all challenges. In the majority of cases it is extremely difficult to depict the circumstances that would have emerged if the research programme had not been implemented.

In this section we survey three main methodologies formulated in the evaluation literature to assess the impact of research on policy and welfare. The three methodologies described try to address the challenges outlined above in different ways. In particular, these methodologies have devised different and imaginative ways to build a counterfactual.

The first might be called the 'policy evaluation' approach. This approach assumes that research determines policy change and it studies the effect of this policy change on welfare indicators. The second approach analyses the research-policy-welfare causal chain and rather than attempting the estimation of the welfare impact of research it focuses on the 'preconditions' that make the impact possible. This might be called the 'testing preconditions' approach. A third approach looks at the effect of research on welfare directly, ignoring the complications and subtleties implied by the policy process. This might be called the 'economic modelling' approach. These three approaches will now be discussed in more detail and their main characteristics are summarised in Table 4.

Table 4. Characteristics of main approaches to the estimation of the impacts of policy-oriented research

Approach and examples	The 'what' - Indicators	The 'how' - Methodology and methods	The 'when'
Policy evaluation approach Fan <i>et al.</i> (2003) Ryan (1999)	Income Poverty Mortality Nutritional status	This approach performs an impact assessment of a policy or project (using standard quantitative evaluation techniques). It identifies to what extent that policy or program was the result of research (via surveys or other empirical methods). It simulates the impact of the project or policy effect on welfare indicators (often using parameters obtained from other studies).	After project completion
Preconditions testing approach Weiss and Bucuvalas (1980)	The 'quality' of research (for example standardisation of techniques and rigorous research processes) and/or the quality of leadership in terms of an decision maker's ability to make judgements on research 'quality'	This approach tests functional relationships between links in the causal chain than runs from research to welfare (by using survey data or behavioural experimental methods).	After project completion and (experimentally) anytime before and after the project
Economic modelling approach See review by Alston <i>et al.</i> (2000)	Crop production Consumer surplus Producer surplus	This approach assesses the economic impact of research on producers and consumers of a particular commodity. Producers benefit through cost reductions but are affected by prices. Consumers benefit via price reductions. The changes in producer and consumer surplus can then be used to simulate the reduction in poverty or other welfare effects. The methods used are IRR and regression analysis.	Several years after project completion

Note: These approaches are about welfare impacts. It is possible simply to focus solely on policy impacts (see Annex III).

The policy evaluation approach looks at the welfare effects of research by assessing the welfare impact of programmes and policies supported by research. The welfare effect of research is simply the welfare effect of programmes and policies based on that particular research. If the cost of research and the number and the size of programmes are known, the net benefit of research can be calculated. All this approach requires is an impact evaluation of the implemented programmes or policies, and a method that allows the attribution of the programme implementation to policy research. The former is obtained through experimental or quasi-experimental analysis of project effects, while the latter is normally obtained through survey interviews among relevant stakeholders.

This methodology is more easily adopted with respect to research conducted in the physical sciences. For example, the welfare effects following the introduction of new crop management technology can be measured and attributed to the research that generated the new technology (Traxler and Byerlee, 1992). Ryan (1999) assesses the welfare impact of trade tax policies in Vietnam promoted by research conducted at IFPRI. Many more examples of this approach can be found in the series of studies reviewed by a publication of the CGIAR Science Council (2008) (see later discussion on agriculture).

A disadvantage of this approach is that it can only be adopted in a limited number of cases in which the links between research, policy and outcomes are very clear. But even in this case it is unlikely to provide a fair assessment of the value of research. In order to see this, suppose that research results into some policy advice. This advice may consist of recommending the adoption of a given policy or of recommending the avoidance of a policy. There are possible benefits to both choices. In addition, the policymakers can simply ignore the policy advice provided by research.

The policy evaluation approach focuses on the effects of policies recommended by research. But welfare effects can result from the policy advice of avoiding a given course of action. For example, policymakers may be advised not to impose trade barriers or a particular tax, which in turn may have positive or negative effects on welfare. Policy avoidance is rarely documented and hardly visible and we are not aware of any study assessing the impact of not adopting a particular policy produced by policy research. Many social scientists, though with little supporting evidence, tend to believe that these (positive) effects are huge for society (Pardey and Smith, 2004).

It is also common that the policy advice provided by researchers is simply ignored. What is the amount of social research that is ignored by policymakers? Many believe that this is very large. For example, Krugman (2004) uses a number of examples, ranging from environmental tax, income distribution, trade policies, etc. to show that 'many of the most important results of policy-relevant research in economics are simply disregarded by the policy process.' According to Krugman the cost to society of this is enormous. Unfortunately, there is no way to estimate the size of ignored research or of the effects that research would have had if followed, so that Krugman's and others' assertions remains little more than claims. The decision of

ignoring policy advice provided by researchers is not necessarily wrong or irrational, a point that we will discuss later on.

The size of research that is ignored by policymakers is difficult to measure and this links to the more general problem of attribution of policy to research. As noted earlier, the idea that once knowledge is produced by research, this is immediately adopted by policymakers and put into practice is rather naïve (Weiss, 1979) and many examples can be found that it this is not what normally happens.⁶ The nature of the policy process and the number of actors involved in policy making is such that is extremely difficult attributing a given policy to a given research. Research will at best contribute to the adoption of a policy and will rarely be the only determinant, as a number of actors including practitioners, journalists, interests groups etc. will contribute to the making of a given policy decision. This problem is acknowledged by the literature assessing policy impact of research and the way this is addressed is by running surveys among key stakeholders and assessing the contribution of research to policy via the elicitation of probabilities (see for example Babu, 2000; Ryan, 1999; Shedeed, 2008) but the reliability of these subjective assessments is open to question.

An additional problem is that knowledge can be employed anytime and anywhere. Thus research may have effects in the very long term or in areas where it was unexpected. There is a high risk that many benefits of research go unaccounted by assessments confined to a limited period of time and country or area. Other factors that make the link between policy and research more difficult to establish include the unintended consequences of research, institutional change effects, selective use of research by the policy process, and multiplicity of objectives (Weiss, 1979). In conclusion, the relationship running from research to policy and from policy to welfare seems to be clouded by so many factors that serious doubts arise regarding the validity of this enterprise. Authors discouraged by the difficulty of establishing links between research, policy and welfare with any reasonable level of confidence, may decide to focus on the preconditions that ensure that research will positively affect welfare. Rather than measuring the effects of research on welfare, researchers may look at the factors that make research more or less likely to be adopted or that make a policy more or less likely to be successful.⁷

⁶ When in 1916-19 US scientist found an economic way to produce high-yielding seeds (the precursor of the green revolution), the director of the USDA breeding program and several directors of the Belt State Agricultural experiment stations were convinced that hybrid corn had no practical value and the results of research were not put into effect until the 1930s (Mundlak, 2005).

⁷ For example Weiss and Bucuvalas (1980) conducted an interesting study of frames of reference for the interpretation of social science research among 150 mental health decision makers in the US. The subjects were given 50 summaries of research reports and were asked a set of 25 questions to elicit their interpretation of the data. Research results suggest that decision-makers judge reports based on two criteria: reliability of and utility of the research findings. Further analysis showed that research is deemed reliable if it employs scientific methods and if it conforms to pre-existing knowledge and experience of the decision maker. Research is considered useful if it is action oriented (shows how to make changes) and if challenges the status quo.

The probability that research will have welfare effects can be assessed by testing some of the preconditions required for research being translated into policy. Two necessary pre-conditions are that research should be of 'reasonable' quality and that policymakers should be able to judge the quality of research.

What constitutes research 'quality' is though contentious. For example, indigenous, participatory, or experiential research may have lower status to mathematical modelling. There is a well-held perception of a 'hierarchy of evidence', especially so in health policy, in terms of methodologies. 'Hard' evidence is that which is seen as objective and quantitative. In contrast, 'soft' evidence is that which is subjective and qualitative.⁸ Systematic reviews and randomised controlled trials are at the top of the hierarchy and expert opinion and anecdotal evidence at the bottom (Davies and Nutley, 2004:480). Although what counts as 'good' evidence is contentious we can list a range of types of 'evidence' in terms of use of 'evidence' in policy processes and research policymakers perceptions of what constitutes 'high quality' evidence.⁹

For example, a higher education project on agriculture may be established with an intention to increase welfare of poor farmers in the long term by promoting the adoption of pro-poor policies in the public and private sectors. While the assessment of such effect is impossible in the short term, and possibly even in the long term, the quality of the research that may result from the project and its use by policymakers can be easily assessed. Similarly, a project may have a long term objective of improving welfare through better agricultural policies, by trying to encourage new leadership in the agricultural sector. While this effect in the long term can be impossible to trace, the leaders' ability to use and interpret good quality research and information can be easily tested and estimated.¹⁰

A third approach to the assessment of welfare impact of research consists of estimating the effect directly by using economic modelling or regression analysis.

⁸ See for discussion (Martson and Watts, 2003:150). Upshur *et al.*, (2001:94) proposed a model of evidence with four distinct but related types of evidence in 4 quadrants for what kind of research is seen as credible in different disciplines. The vertical axis is methodology – meaning to measurement and the horizontal axis is context – particular to general context. The four were qualitative personal (concrete/historical), qualitative general (concrete/social), quantitative personal (personal/mathematics) and quantitative general (impersonal/mathematics). They argued that each of these dominated in different disciplines. The first in clinical medicine, the second in social sciences, the third in clinical epidemiology and the fourth in economics and political science

⁹ Davies (2004:7) argues there are six types of evidence (research evidence; systematic reviews; single studies; pilot studies and case studies; expert's evidence and Internet evidence) and seven types of research evidence (attitudinal evidence - surveys, qualitative; statistical modeling - linear and logistic regression; impact evidence - experimental, quasi-experimental, counterfactual; economic and econometric evidence - cost-benefit, cost effectiveness, cost utility, econometrics; ethical evidence - social ethics and public consultation; implementation evidence - experimental, quasi-experimental qualitative, theories of change; and descriptive analytical evidence - surveys, admin data, comparative and qualitative). The 'quality' of 'evidence' issue has also been emphasized across various studies (e.g. Court *et al.*, 2005; Dinello and Squire, 2002). Davies and Nutley (2005:58) argue there is a perception that 'hard' evidence is that which is seen as objective and quantitative. In contrast, 'soft' evidence is that which is subjective and qualitative.

¹⁰ These examples will be discussed in more detail below.

This type of approach was pioneered by Schultz (1953) and Griliches (1958) and their examples have been followed by several authors. These studies are based on an assessment of the effects of increases in agricultural productivity. This is done in two possible ways. The first consists of the calculation of benefits to society (both producers and consumers) of increases in the quantity and the price of a given commodity. The second consists of estimating the impact on production or productivity of investments in research using regression analysis. Both approaches estimate research benefits and produce estimates of internal rates of return.

Alston *et al.* (2000) provide a review and a meta-analysis of all studies (nearly 300) conducted on the welfare effects of agricultural research since 1953. Most studies find a positive effect of research on welfare and the median internal rate of return among the studies reviewed is 44% per year. Alston *et al.* (2000) also point to the limitations of these studies. First, all these studies adopt the commodity market model, whereby the welfare effect of research on a specific crop is analysed. This leaves research in other fields totally unexplored. Second, the studies are often based on overestimations of benefits and underestimation of costs. Third, all studies are based on heroic assumptions about attribution of policies to research. Fourth, there are effects that go unnoticed because occur after considerable time or in unexpected areas.

It should also be added that these studies can only be performed *ex-post*, many years after the research has been conducted, and that they are highly demanding in terms of data on research cost and consumer benefits. Finally, these studies do not say anything about how welfare is generated via the policy process, as they ignore the problem altogether. In this sense, they are poorly informative of the reasons for why research may or may not increase welfare.

Another rather troubling aspect of this type of research is that all the studies conducted have produced a large variety of results. The dispersion around the mean of the calculated rates of returns of research is very high. Much of the difference in the rates of return depend on the characteristics of the study, the area researched and the researcher, but Alston *et al.* (2000) were not able to explain this variation entirely using differences in methodologies used and other factors. Overall the variability of the results reduces the credibility of any single study, and this probably helps explaining the reluctance of policymakers in taking economists' advice on the value of research. There is no agreement among social scientists on the size of the welfare effect of research, though it seems undisputed that research has a positive effect on welfare and that this is likely to be high.

Table 4 summarises the main characteristics of the three approaches. The choice of the methodology to estimate welfare effects of research will depend on the objective of the study. Three factors seem to be particularly important: (a) whether the study is about a single project or a package of interventions, (b) whether the study needs to report welfare indicators or data on welfare determinants will suffice, and (c) whether the study is needed soon after completion or long after the interventions.

If the objective of the study is assessing welfare effects of a portfolio of interventions, then the economic modelling approach is preferable because the outcomes of the other two types of studies can hardly be extrapolated to an entire package of projects. If the focus is on obtaining measurable and accepted welfare indicators, like for example poverty, then the policy evaluation approach should be taken. Studies testing preconditions are able to tell whether a project will achieve a given welfare outcome or not and under what condition, but will rarely be able to measure the size of the effect. On the other hand economic modelling constrains the researcher to a narrow definition of welfare, like consumer and producer benefits. Finally, if the interest of the study is an *ex ante* assessment of the likelihood of project success or if the study has to be conducted immediately after project completion, then the preconditions testing approach should be chosen. This approach allows testing of hypotheses during and after the project, and if conducted on an experimental basis can also offer *ex ante* predictions of project success. The other two approaches rely heavily on aggregated data that become available only many years after the project has been completed.

5. SURVEY OF STUDIES OF AGRICULTURE RESEARCH IMPACT ASSESSMENT

This section surveys the agriculture literature and locates key studies by type of impact assessment and by theory of change components (i.e. vision, preconditions, and interventions). Qualitative analyses of policy impact within these studies are also reviewed.

5a. Studies chosen

We identified 13 studies of agriculture research impact assessment (see Table 5). The list includes only studies that made an explicit effort to address the evaluation challenges outlined in Section 4. In particular, only studies based on a rigorous counterfactual analysis were considered. Each study is a study of the impact of an earlier piece of policy-oriented research. The 13 studies exclusively analyse research which is applied and explicitly aiming to be use oriented. In short, they all belong to the Edison's 'pure applied' model of research discussed Section 2.

These 13 studies cover a range of country contexts - Bangladesh, Indonesia, Jordan, Kenya, Malawi, Mexico, the Philippines, Syria, Uganda and Viet Nam – as well as a range of policy changes – rationing, food for education, pulp and paper policy, barley fertilisation, conditional cash transfers, dairy marketing, fisheries management, rice marketing, food security, pesticides, water management and urban agriculture and a range of welfare impacts including agriculture productivity, schooling and consumer surpluses.

Most impact studies of policy research in agriculture reveal that analysing attribution and influence of 'policy-oriented' research is certainly not an easy task. As earlier noted, there is 'uncertainty in determining a causal link between research and the outcome of a policy or the value of a policy outcome' (Timmer 1998:11) and there is

difficulty of quantifying the actual policy or welfare impact. All studies reviewed found severe difficulties in assessing impact on welfare outcomes and either renounced doing so or did assess impact under a number of heroic assumptions.

The majority of the studies reviewed employed either the policy evaluation or the economic modelling approach, and only three studies were concerned with testing preconditions of success. Moreover, the latter studies did so mostly qualitatively and rarely attempting a quantitative analysis of factors leading to programme success. The reliance of impact assessments on the analysis of target and welfare outcomes indicators well respond the auditing need of evaluation, but is rather unhelpful at identifying the factors determining the outcomes.

In each of these 13 studies it is possible to identify the 'vision of success', the 'pre-conditions' and the 'interventions' (see later detailed discussion of indicators). Table 6 lists the 'visions' used.

In some cases the studies are based solely on policy impacts as the 'vision of success' (and it is assumed welfare impacts follow) in others studies it is both policy impacts and welfare outcomes. For example, welfare impacts include agricultural productivity, environmental benefits or improvements in schooling. These might be thought of as 'end-goal visions of success'. In contrast, policy impacts might be labelled an 'intermediate vision of success' and include policy change, changes in policy implementation and other policy changes outlines earlier.

5b. 'Pre-conditions'

Table 7 lists the 'pre-conditions' in each of the 13 studies. For example, aspects highlighted relating to policy actors such as the existence of policy 'champions' in government and support from donors in terms of funding and influence.

Aspects relating to the policy narrative highlighted were the already existing credibility of research organisations and researchers built in the long run and research conforming to policymaker's expectations.

Finally, there are 'pre-conditions' relating to the policy context highlighted such as a conducive policy environment and receptiveness towards research, demand for research generated evidence and the long standing presence of research institutions and their programmes.

However, it is important to note that one of the difficulties in comparing various studies is that they employ different framework for analysis. For example, while some studies explicitly examine the policy actors, narratives and context (e.g. Hooton *et al.* 2007), other studies such as those that are part of CGIAR (2008) use a method (the Impact Pathways method) which does not necessarily capture these.

5c. 'Interventions'

Table 8 lists the 'interventions' in each of the 13 studies. All the projects that funded these studied made explicit attempts to inform policy and had well-designed

communication strategies. In terms of networking, agricultural policy-oriented research collaboration and engagement of a range of policy and decision-makers become very important. For example,

- Researchers worked in collaboration with the Ministry of Agriculture and Rural Development in the case of rice policy change in Vietnam.
- In Bangladesh researchers collaborated with decision makers and operated within the decision-making system to facilitate their use of information.
- In Syria researchers linked up with one key 'policy champion' who was a member of the Fertilizer Allocation Committee.

In terms of 'messaging', in all of the cases of policy impact of research, it is seen that documentation and dissemination of research findings is one key element to influence policymakers. The research outputs can take various forms such as reports, papers, training manuals, posters, policy briefs, journal publications and conference presentations. In almost all the cases, a series of workshops, conferences and seminars were organised to disseminate the research findings. This is not a one-time effort. In fact looking at this list in the table below one might think 'saturation' or sheer volume of written outputs and meetings is key. In almost all of the cases there have been several publications and dissemination events targeting various stakeholders and policy-makers at various levels.

In terms of opportunism, the identification of a favourable environment for adoption of the new policy is crucial. For example, in Bangladesh, the timing of research coincided with the need for information. It is also seen from the cases that no matter how robust the research findings are unless there is a favourable policy environment consisting of a strong political will, a receptiveness to change, and the existence of trust between and among those most responsible for policy, the adoption or changes of policy becomes difficult as shown by the case of IRRI research in Philippines. In the case of Malawi, UNICEF's persistent call for greater attention to the food insecurity problems and malnutrition in the 1980s created a receptive environment in which the government sought research to inform policy choices.

Three factors that one could draw from the set of 13 studies and interventions or what researchers can do to maximise their chances of impact are (i) 'saturation' – a high volumes of written outputs and workshops/seminars/etc.; (ii) 'recognition' - of a conducive political environment if it exists; (iii) 'relationships' – building long term relationships to become a trusted source.

In the IFPRI review of various case studies on the impact of agricultural policy research, Ryan and Garrett (2003) identified nine key conditions which are conducive to the generation of impact. These actually collapse into the three categories we use here. Two of their factors can be related to networking: (1) Long-term, in-country presence of researchers, (2) Strategic choice of partners and the identification of 'policy champions' who may effectively advocate for policy change.

A further three could be related to 'messaging': (3) Production of high-quality, independent research, (4) Presentation of empirical data and simple analysis, (5) Need to establish and fortify a consensus among stakeholders.

Finally two more could be related to 'opportunism': (6) Timely availability of relevant research information, (7) Need for a policy environment conducive to research results. Beside these they also suggest (8) Likely trade-off between immediate production of results and the long-term building of in-country capacity for policy analysis, and (9) Learning from cross-country experiences to improve ways of conducting research and influencing policy change.

Babu (2000) too is consistent with the networking-messaging-opportunism approach. Basu points to three lessons from his analysis of case studies of policy impact of research in Bangladesh. These include (1) the ownership and sustainability of the research is enriched by setting priorities through regular client-consultation, involving local researchers and key analysts as collaborators, and choosing skilled and committed research personnel; (2) the acceptance and adoption of research results can be improved through objective research, and by identifying windows of opportunity for result sharing, and tailoring policy communication strategies; and finally (3) the acceptance and adoption of research results is enhanced by capacity-strengthening activities strategically tied to information sharing.

5d. Qualitative analyses of policy impact

The research reviewed on policy impacts of agriculture policy-oriented projects has involved, in almost all cases, qualitative approaches and studies of people's perceptions (except one case where a combination of episode study, case study and outcome mapping was undertaken). Qualitative approaches are useful when provide retrospective narratives that illustrate how research influences policy (Ryan and Garrett 2003: 2-3). Case studies provide rich, qualitative data for analysis and are the most used approach in assessing how research interacts, influences and impacts policy processes in any particular context (see Table A1 in the Annex 3).

Key informant interviews have been widely preferred tool in all of these cases. These interviews have been taken either in-person face, by telephone or email. The CGIAR (2008:84) observes that 'the studies that relied on single-interviewer taped conversations seemed to establish more credibility on the issue of influence than those that drew solely on written questionnaires, especially mailed-in responses'.

In the majority of the case studies featured in the CGIAR (2008:84) review, 'impact pathways' methods have been effectively used. This method consists of mapping out the trajectories of the research to policy from 'where information entered the system, the paths it took, and the decision-makers it influenced, and then sought to verify these assumptions of transmission and uptake'.

Table 5. Studies of agriculture research impact assessment

Impact assessment (details and reference)	Study which the impact assessment explored	Type of impact assessment and timing
Rural Rationing (RR) program in Bangladesh, Babu (2000)	Ahmed (1992)	Policy evaluation Closure + elapsed time (6 years)
Food for Education program in Bangladesh, Babu (2000)	Ahmed and Billah (1994)	Policy evaluation Closure + elapsed time (4 years)
In-Trust Agreement between FAO and CGIAR, Gotor (2008)	Siebeck and Barton (1992)	Policy evaluation Closure + elapsed time (6 years)
Pulp and Paper Policy in Indonesia, Raitzer (2008)	Barr (2000; 2001)	Economic modelling and policy evaluation Closure + 6 years
Barley Fertilisation Policy in Syria, Shideed <i>et al.</i> , (2008)	El-Hajj <i>et al.</i> (1990)	Economic modelling Closure + 17 years
PROGRESA Anti-poverty and Human Resource Investment Conditional Cash Transfer Programme in Mexico, Behrman (2007)	Behrman & Hoddinott (2000)	Policy evaluation During programme
Dairy Marketing Policy in Kenya, Kaitibie <i>et al.</i> , (2008)	SDP publications: research reports, policy briefs and May 2004 Dairy Policy Forum organised by SDP and partners.	Economic modelling Closure + time lapse (2 years)
Pesticide Package Programme (PPP) in Philippines, Templeton and Jamora (2008)	Márquez <i>et al.</i> , (1990), Pingali and Márquez, (1990), Pingali and Palis, (1990), Antle and Pingali, (1991), (1994), Pingali <i>et al.</i> (1992), Rola and Pingali, (1993), Pingali and Roger, (1995)	Economic modelling and policy evaluation Closure + elapsed time (16 years)
Community-based Fisheries Management (CBFM) in Bangladesh, Pems <i>et al.</i> , (2008)	Various publications (see list in Pems <i>et al.</i> , 2008)	Preconditions testing Closure
Rice Marketing Policy in Vietnam, Ryan (1999a)	IFPRI (1996) Goletti and Minot (1997), Minot and Goletti (1997, 1998).	Economic modelling Closure + elapsed time (1 year)
Community based food security and capacity building in Malawi, Ryan (1999b)	Various publications (see list in Ryan, 1999b)	Preconditions testing Closure
Greywater Reuse in Jordan, Surani (2003)	Faruqui & Al-Jayyousi (2002); Faruqui (2003); Bino & At-Beirut (2003)	Policy evaluation Closure
Urban Agriculture Ordinances in Uganda, Hooton <i>et al.</i> (2007)	Maxwell (1994); Maxwell (1995); Van Nostrand (1994); Atukunda (1998); Urban Harvest (2005)	Preconditions Closure + elapsed time (since there are various pieces of research the exact number of years varies).

Table 6. Survey of studies on agriculture research impacts by ‘vision of success’

Reference	‘Vision of Success’ (VoS)	
	Overall VoS: Welfare impacts	Intermediate VoS: Policy impact
Rationing program in Bangladesh, Babu (2000)	No welfare impact. The abolition of a wasteful and inefficient food delivery program generates project savings.	Policy content impact - May 1992 - decision to abolish the Rural Rationing Programme
Food for Education program in Bangladesh, Babu (2000)	Increase enrolment and school attendance of children assisted by a school feeding program. The impact on per capita calories consumption is simulated.	Behavioural change in policy implementation – 1994/95 - decision to expand the FFE program
In-Trust Agreement between FAO and CGIAR, Gotor (2008)	Agricultural productivity, but not quantified.	Policy framing impact - 1994 - In-Trust Agreement established between FAO and CGIAR
Pulp and Paper Policy in Indonesia, Raitzer (2008)	Environmental benefits in terms of forest area saved and other external factors.	Policy procedural impact - 2003 - Ministerial decree adopted requiring Indonesia's pulp mills to source all its wood from plantations by 2009.
Barley Fertilisation Policy in Syria, Shideed <i>et al.</i> , (2008)	Change in consumer surplus in the barley market.	Behavioural changes in policy implementation - 1989 - New fertilizer allocation policy implemented.
PROGRESA Anti-poverty and Human Resource Investment Conditional Cash Transfer Programme in Mexico, Behrman (2007)	Children’s schooling.	Policy framing impact - 2000 - Continuation of PROGRESA programme by Mexican Government.
Dairy Marketing Policy in Kenya, Kaitibie <i>et al.</i> , (2008)	Change in consumer surplus in the milk market.	Policy procedural impact - 2004 - a set of dairy industry regulations was issued.
Pesticide Package Programme (PPP) in Philippines, Templeton and Jamora (2008)	Expenditure (measured in savings resulting from fall in pesticide use and savings from reduction in health cost after reduction in toxicity of production process).	Policy content impact - 1992 - Pesticide Policy Package.
Community-based Fisheries Management (CBFM) in Bangladesh, Pems <i>et al.</i> , (2008)	Increase in income from fisheries and other positive environmental effect – but the effects were not quantified.	Behavioural changes in policy implementation - ongoing - Changes in opinion and awareness of CBFM among relevant policy-makers.
Rice Marketing Policy in Vietnam, Ryan (1999a)	Changes in poverty simulated by estimated changes in production, prices, and volume of trade.	Policy content impact - 1998 - New rice marketing policy implemented.
Community based food security and capacity building in Malawi, Ryan (1999b)	Malnutrition and mortality, but the effects are not quantified.	Policy framing impact - early 1990s -awareness within the government of Malawi of the need for community-based food security and monitoring systems.Establish Masters degree program at Bunda cCollege of Agriculture established in 1994.
Greywater Reuse in Jordan Surani (2003)	No welfare outcomes are quantified.	Policy procedural impact - 2003 - Revision of the National Housing Codes and formation of a National Committee to formulate Greywater Reuse Guidelines.
Urban Agriculture Ordinances in Uganda Hooton <i>et al.</i> (2007)	Food security, but impact is not quantified.	Policy content impact - May 2005 - A set of five new ordinances on urban agriculture passed.

Table 7 Survey of studies on agriculture research impacts by 'pre-conditions'

Reference	'Pre-conditions'		
	Policy actors	Policy narratives	Political context
Rural Rationing program in Bangladesh Babu (2000)	<p>The role of donors in helping the government make informed decisions.</p> <p>Several other entities (such as Bangladesh Rural Advancement Committee and Beacon Consultants) informed the Government of Bangladesh of the specific need for food sector reforms.</p> <p>Conducive existing decision making systems.</p>	<p>Research conformed to policy maker's expectations.</p> <p>Research clearly revealed the existing ineffectiveness and leakage in the RR programme.</p>	<p>Food sector reforms being pushed by donors like WB and USAID since 1980s and gradually gaining momentum during the early 1990s.</p> <p>The findings from the research regarding leakage in the RR program published by a leading daily newspaper – which led to the immediate response from the then Minister of Finance.</p> <p>The timing of IFPRI research coincided with the need for information.</p> <p>The new (reformist) government, which took over in 1991, favoured abolishing the RR programme, believing that the choice of dealers in the earlier regime had been politically motivated.</p>
Food for Education program in Bangladesh Babu (2000)	<p>Because of the advisory role of IFPRI in RR programme, IFPRI was asked to chair the Working group on Targeted Food Interventions formed to conduct a systematic review of alternative mechanisms for distributing food to the poor.</p> <p>The then-prime minister, Ms. Khalida Zia, who was also seeking new programmes to support the poor, recommended the FFE programme through her secretariat.</p>	<p>FFE programme attained international recognition as an innovative programme for providing short-term relief to poverty stricken households and long-term growth through human capital investment.</p> <p>Early assessment study concluded that the FFE programme was highly successful in fulfilling its stated objectives and had the lowest leakage.</p>	<p>The abolition of the RR programme opened up opportunity to develop new programmes for targeting food subsidies to the poor.</p> <p>Policymakers and donor agencies who were looking for innovative programme approaches.</p> <p>The working group on targeted food interventions presented decision-makers with a range of options for combating</p>

			malnutrition.
In-Trust Agreement between FAO and CGIAR Gotor (2008)	n/a	Biodiversity commissioned research proposed concept of 'trusteeship' as a solution to the issue of ownership of CGIAR collections had local resonance/traction.	Long-running international debates over germplasm material exchange; the issue of ownership of CGIAR collections.
Pulp and Paper Policy in Indonesia Raitzer (2008)	<p>Various NGOs advocated for environment conservation.</p> <p>The visibility of the research and the detailed data it provided were quickly utilized by various NGOs (WWF, Friends of Earth, Environmental Defence, etc) as evidence for their environmental advocacy.</p> <p>Asia Pulp and Paper (APP) and Asia Pacific Resources International Limited (APRIL) undertook specific conservation commitments, stimulated as a result of NGO advocacy.</p> <p>CIFOR had a long standing research program on 'Underlying causes of deforestation' (1993-2003).</p>	The research provided quantitative evidence of the economic performance and viability of the pulp industry for the first time (existing lack of information).	The increased environmental standards of international pulp buyers and concerns about the sustainability of Indonesia's pulp production – led to increased attention to the issues of environmental conservation.
Barley Fertilisation Policy in Syria Shideed <i>et al.</i> , (2008)	Representation of main policy entity (Fertilizer Allocation Committee) in the Higher Agricultural Council		<p>Receptive policy environment (to be self-sufficient in major food and feed crop).</p> <p>Changing perceptions on barley fertilization risk.</p>
PROGRESA Anti-poverty and Human Resource Investment Conditional Cash Transfer Programme in Mexico	PROGRESA was praised by leading economist and other international media and journals as 'pioneering', 'a successful model', and 'newest and most innovative		

Behrman (2007)	social policy'.		
Dairy Marketing Policy in Kenya Kaitibie <i>et al.</i> , (2008)	SDP's civil society partners played a key role - getting across policy messages from SDP research; facilitating high-level meetings and advocacy; use of media; and mobilisation of farmer advocacy groups to put increased pressure for policy change. DFID's shift to focus on Sustainable Livelihoods Approach in the mid 1990s was an important influence on SDP.		Changing political context - government recognition of the liberalised policy environment in the dairy sector and willingness to make necessary amendments in the dairy policies. Increased role of civil society organisations, helped by the Constitutional Review process, which led to better channelling of citizen voice into policy processes.
Pesticide Package Programme (PPP) in Philippines Templeton and Jamora (2008)	The backing from the media and civil society groups were valuable to rally public support for FPA decisions.	An existing body of research provided evidence of the negative environmental and human health effects from the excessive use of pesticides particularly insecticides.	Changes in the political environment led to a paradigm shift in the national agricultural agenda and strong political will, which provided policy-makers with a strong political platform upon which policy change could be pursued. Changing global environment, international code of conduct, regulations and alliances (Philippine's participation in the FAO and WHO international conferences on harmful effects of toxic agricultural chemicals) also influenced the actions of policymakers.
Community-based Fisheries Management (CBFM) in Bangladesh Pems <i>et al.</i> , (2008)	n/a	n/a	Long standing programme presence on fisheries management (1987-2007) under various project phases.
Rice Marketing Policy in Vietnam Ryan (1999a)	Various institutions in Viet Nam helped to build the consensus in effecting the policy change, such as government departments,	A degree of confidence among policymakers that the use of research is in Vietnam's national interest and they	There was receptiveness to the insights to be gained from research that addressed the policy environment surrounding a

	<p>(Department of Planning and Projection, Department of Agricultural and Rural Development Policy), major research institutions (National Institute of Agriculture Planning and Projection, Hanoi Agricultural University, the Institute of Agricultural Economics, National Economic University, Can Tho University, Mekong Rice Institute) and other collaborators like other government departments, banks and statistical office.</p> <p>International stakeholders like ADB and World Bank played an indirect role in the processes underlying the government's rice policy decisions.</p>	<p>became advocates for the policy recommendation that were emerging from the study even before the publication of the final research report.</p>	<p>strategic and economically important food crop like rice.</p> <p>A proposal for technical assistance to the ADB in the context of an agricultural sector loan to Viet Nam.</p> <p>A period of falling rice prices which triggered farmer agitation in the south – subsequently intense discussion took place within and among ministries and the government offices about price policy, exports and internal trade.</p>
<p>Community based food security and capacity building in Malawi</p> <p>Ryan (1999b)</p>	n/a	<p>The databases on food security and nutrition in Malawi are regarded by many as among the best of any African country.</p>	<p>The policy environment in the late 1980s, as a result of continuous UNICEF advocacy, was conducive to food security and nutrition monitoring, research, training and information role for IFPRI.</p> <p>There was a major food security and nutrition challenge and a ready-made clientele for rigorous data collection, analysis, and policy formulation in which the research organisations had an acknowledged comparative advantage.</p>
<p>Greywater Reuse in Jordan</p> <p>Surani (2003)</p>	<p>Formation of networks (between policymakers, researchers, private sector, and beneficiaries) through which knowledge (policy and technology) flows.</p> <p>Openness to capacity building among</p>	n/a	<p>A conducive policy environment - receptive to research.</p> <p>Growing awareness of the water crisis facing the country.</p>

	<p>policy-makers.</p> <p>Existing credibility and expertise of organisations/individuals.</p> <p>Improved link and relationship between researchers and public policy-makers as a result of a 1998 problem with polluted water.</p>		
<p>Urban Agriculture Ordinances in Uganda</p> <p>Hooton <i>et al.</i> (2007)</p>	<p>The formation of KUFSAALCC (Kampala Urban Food Security, Agriculture and Livestock Coordination Committee).</p> <p>Timely and creative availability of donor funds was instrumental.</p> <p>Supportive political leaders, e.g. Mayor and City Minister played key roles in influencing others.</p>	<p>The existing broad range of research evidence (both socio-economic and technical).</p>	<p>Decentralisation and devolved law making demanded local politicians to be more responsive and accountable to the voters' needs.</p> <p>Poverty Eradication Action Plan (PEAP) put poverty reduction at the heart of national and local policy.</p>

Note: n/a implies the study did not analyse that particular dimension.

Table 8 Survey of studies on agriculture research impacts by ‘interventions’

Reference	‘Interventions’		
	Networking	Messaging	Opportunism
Rationing program in Bangladesh Babu (2000)	<p>Collaboration of researchers with decision-makers and researchers operating within the decision-making systems.</p> <p>Sharing of research findings with the collaborators in the Food Planning and Monitoring Unit (FPMU) and the Ministry of Food (MOF).</p>	<p>High quality research conforming to decision-maker's expectations; and outlining a specific course of action.</p>	<p>The timing of research coincided with the need for information.</p>
Food for Education program in Bangladesh Babu (2000)	<p>Researchers mobilised the support of key players involved in food and nutrition programming and policymaking for the sake of developing intervention options including FFE.</p>	<p>Sharing of preliminary results with the steering committee and other selected institutions</p> <p>The results of the assessment were widely quoted in the program documents prepared for government officials.</p>	<p>A programme vacuum was created after the abolition of the RR programme.</p>
In-Trust Agreement between FAO and CGIAR Gotor (2008)	<p>Facilitated dialogue among a range of institutions and partners CGIAR centers, governments of countries hosting CGIAR genebanks, FAO and its constituencies, farmers’ rights advocacy groups, and other stakeholders.</p>	<p>Technical papers were disseminated and seminars organised to inform interested parties.</p>	<p>n/a</p>
Pulp and Paper Policy in Indonesia Raitzer (2008)	<p>n/a</p>	<p>Research outputs disseminated in form of articles in journals and papers, and publication of a book.</p> <p>Dissemination through presentation in 28 different seminars in 10 countries; including donor fora, pulp industry meetings, finance industry meetings,</p>	<p>n/a</p>

		academic seminars, and media events.	
Barley Fertilisation Policy in Syria Shideed <i>et al.</i> , (2008)	Involvement of key policy unit in research project design and implementation. A member of the Fertilizer Allocation Committee with strong connections with Ministry of Agriculture and Higher Agricultural Council acted as a policy champion.	Dissemination of results with relevant policy entities; Public/policy maker awareness; Specialised workshops	Receptive policy strategy
PROGRESA Anti-poverty and Human Resource Investment Conditional Cash Transfer Programme in Mexico Behrman (2007)	n/a	Advantage of having an international organisation undertake the PROGRESA evaluation that was not viewed as captive to national or international interests and that had a reputation of undertaking objective policy-related research.	n/a
Dairy Marketing Policy in Kenya Kaitibie <i>et al.</i> , (2008)	The collaboration between MoLFD, KARI and ILRI on SDP and SDP's links with advocacy partners proved effective in advocating policy change.	Publication and dissemination of 10 SDP research reports, 38 conference presentations, 9 extension papers, 1 poster, 10 policy briefs, 4 journal publications, 1 doctoral and 2 masters theses.	n/a
Pesticide Package Programme (PPP) in Philippines Templeton and Jamora (2008)	n/a	Building international alliances.	Networking into a receptive policy environment and the existence of trust between and among those most responsible for agricultural policy.
Community-based Fisheries Management (CBFM) in Bangladesh Pems <i>et al.</i> , (2008)	n/a	Community-based Fishers Management PORIA was able to clearly show and document the changes in opinion and awareness of relevant policy-makers	n/a

Rice Marketing Policy in Vietnam Ryan (1999a)	Researcher's collaboration with the Ministry of Agriculture and Rural Development helped convert the research findings into action.	IFPRI held 19 seminars and workshops to disseminate the findings, delivered 23 reports, papers and training manuals to key decision-makers and stakeholders.	Addressing a pressing policy issue.
Community based food security and capacity building in Malawi Ryan (1999b)	n/a	More than 40 papers and a working paper series. Training and capacity-strengthening activities Running of a masters program	Responding to a receptive environment in which the government sought research to inform policy choices.
Greywater Reuse in Jordan Surani (2003)	Good relations between the Jordanian partners and IDRC, strategic use of available resources. Credibility and expertise of various individuals/ organisations involved with project implementation.	Technical input of IDRC, dissemination of findings, the sense that the projects provided an immediate 'solution to a problem' within the cultural context	Responding to a conducive country environment
Urban Agriculture Ordinances in Uganda Hooton <i>et al.</i> (2007)	Building of coalition KUFSAALCC (Kampala Urban Food Security, Agriculture and Livestock Coordination Committee) from previous development activities; Diverse partnerships and networks, multiple strategies for lobbying and advocacy	Producing a range of evidence (continuous flow of socio-economic and technical research outputs), use of strategic communication with policymakers using field visits, targeted meetings and written briefs.	Responding to devolved decision-making.

Note: n/a implies the study did not analyse that particular dimension

6. TYPES OF INDICATOR

6a. Indicators of output, outcomes, policy impacts and welfare impacts

This section presents a variety of indicators that can be used in the evaluation of research projects. Ryan and Garrett (2003) suggest various indicators for the products of policy research (see Table 9) by research outputs, outcomes and policy responses and welfare impacts.

We take a similar approach however we present indicators also after disentangling the relationship between research and welfare assumed in their causal pathway. Research produces information (output) that generates a change in policy-makers perceptions and attitudes towards a given policy issue (outcome). The change in policy attitudes results in a policy change (policy impact) which then determines some welfare outcomes (welfare impact). To better illustrate the suggested methodology, this section will provide examples of indicators for the aforementioned list of 13 studies of agricultural research impact assessment. Further examples of typical projects are also given.

6b. The policy change-welfare link

We begin our analysis from the final link in the chain, whereby a policy change results in a welfare outcome. There are three main ways in which policies can improve welfare. First, policies can raise welfare along some of its dimensions like income, education and health. Second, policies can affect the distribution of income in a way that society considers desirable, for example by reducing the extent of poverty, or by channelling resources to women. Finally, policies may increase household security by reducing risk and uncertainty in the availability of services and resources.

The fifth column of Table 10 presents a number of possible welfare indicators for the evaluation of the 13 agricultural research impact assessment studies. Indicators include child nutrition, school enrolments, agricultural yields, rural income and consumption, poverty reduction, and health and environmental effects. The measurement of these welfare indicators can be performed in two ways: by direct observation or by simulation. In the first case, the indicators are measured using household surveys run at the beginning and at the end of a project. The evaluation can collect its own data or use secondary data collected by other sources like statistical agencies and projects run by other organisations. In the second case – simulation – no direct observation of welfare outcome is made. Rather, it is assumed from theory and from past research experience that a policy of a given type and size will have a given effect on welfare outcomes. For example, the literature may suggest the effect on household expenditure of the removal of a tax and this can be used to estimate the impact on poverty.

Table 9. Ryan and Garrett's (2003) Indicators of Policy Research Impact

Outputs	Outcomes	Policy impacts	Welfare impacts
Publications <ul style="list-style-type: none"> - number and type; refereed/ non-refereed 	Publications <ul style="list-style-type: none"> - citations, use in curricula, circulation numbers, sales, requests, web hits 	Changes in policies attributable to policy research Reinforcement of existing policies Implementation of policy changes Changes in institutions	Reduced poverty Improved food and nutrition security Sustained livelihoods of the poor Enhanced natural environment
Methodologies <ul style="list-style-type: none"> - description; value-added 	Methodologies <ul style="list-style-type: none"> - use of new methodologies 		
Training <ul style="list-style-type: none"> - number of trainees; extent of training; duration of training; number and type of manuals 	Training <ul style="list-style-type: none"> - trainee promotions; number of other trained by IFPRI trainees 		
Seminars/ Symposia/ Conferences <ul style="list-style-type: none"> - number; type; ;number of participants 	Seminars/ Symposia/ Conferences <ul style="list-style-type: none"> - number of policymakers present and extent of influence on policy; invitations to IFPRI staff to present keynote and other papers at other meeting, number of organisations, and whether expenses were paid 		
Press Releases <ul style="list-style-type: none"> - number; type 	Press Releases <ul style="list-style-type: none"> - number of press releases published and in what fora; letters to editors spawned as a result 		
Press Conferences <ul style="list-style-type: none"> - number - type 	Press Conferences <ul style="list-style-type: none"> - number of press articles that resulted and in what fora 		

Capacity Strengthening of Partner Institutions	<p>Capacity Strengthening</p> <ul style="list-style-type: none"> - invitations to IFPRI staff and management to be on committees adjudicating policy changes in partner organisations and countries, refereeing assignments of IFPRI staff, request for additional research in response to earlier outputs, degree of success in acquiring additional resources for policy research to partner institutions 		
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Table 10 Survey of studies on agriculture research impacts by potential indicators of success

Reference	Output	Outcome	Policy change	Welfare
Rationing program in Bangladesh Babu (2000)	Project performance study	Change in policy attitudes	Abolishment of rationing program. Changes in resources allocations within the ministry	Child nutrition
Food for Education program in Bangladesh Babu (2000)	Project performance study	Support of key players and international recognition	Changes in resources allocations within the project	School enrolments Child nutrition
In-Trust Agreement between FAO and CGIAR Gotor (2008)	Facilitation of an agreement among stakeholders on sharing genetic resources	Stakeholders agreement	International treaty on exchange of genetic resources and spread of plant genetic resources across national boundaries	Agricultural yields Rural incomes
Pulp and Paper Policy in Indonesia Raitzer (2008)	Research on forestry policies	Advocacy success among policymakers and key informants	Ministerial decree and reduction in the exploitation of tropical forests	Environmental benefits
Barley Fertilisation Policy in Syria Shideed <i>et al.</i> , (2008)	Research on fertiliser use	Perceptions of influence among partners, stakeholders and policymakers	Tax and government allocation policies and barley pricing and fertiliser allocation	Rural incomes
PROGRESA Anti-poverty and Human Resource Investment Conditional Cash Transfer Programme in Mexico Behrman (2007)	Program evaluation	Influence among key players involved in the process and representatives of international organisations	Continuation of PROGRESA activities	Child schooling
Dairy Marketing Policy in Kenya Kaitibie <i>et al.</i> , (2008)	Research on dairy markets and policy	Behavioural change among field regulators of dairy industries	Dairy industry regulations towards market and licensing liberalisation	Food consumption Rural income
Pesticide Package Programme (PPP) in Philippines Templeton and Jamora (2008)	Research on harmful health and economic effects of pesticides	Paradigm shift in the Philippine public agricultural agenda	Adoption of pesticide policy package and reduction in use of hazardous pesticides	Health and economic benefits (savings)

Community-based Fisheries Management (CBFM) in Bangladesh Pems <i>et al.</i> , (2008)	Research on management approaches for fisheries	Increased awareness of the Department of Fisheries and the Ministry of Fishery and Livestock	Adoption of community based fishery projects and improvement in fisheries management	Environmental effects Income and consumption
Rice Marketing Policy in Vietnam Ryan (1999a)	Research on rice market and policies	Perceptions of partners and stakeholders	Removal of export quotas and increase in production and export of rice	Rural incomes Poverty reduction
Community based food security and capacity building in Malawi Ryan (1999b)	Research on food security and monitoring	Perceptions among stakeholders of value and influence of IFPRI research	Response to drought and state-level nutrition policies and better targeting interventions	Child nutrition
Greywater Reuse in Jordan Surani (2003)	Evaluation of four development projects	Policy influence among academics, donors and civil society	Improved management of wastewater at the local level	Agricultural productivity Agricultural income
Urban Agriculture Ordinances in Uganda Hooton <i>et al.</i> (2007)	Agricultural research	Behavioural change by extension officers	Shift in recommended agricultural practices	Poverty reduction

There are both theoretical and practical problems that affect the measurement of welfare indicators. On the theoretical side there are the difficulties already outlined. Policy change is narrowly viewed, ignoring the consequences of policy avoidance and the subtleties of the policy process. There may be spillover effects of a given policy that become manifest in other areas or over time. There are serious difficulties in building a counterfactual unless the study is based on a rigorous impact evaluation. On the practical side the welfare measurement can only be performed long after the project is completed, and the measurements may be very data demanding, particularly in the case of simulations.

6c. The research-policy change link

The second link in the causal chain is the impact of research on policy. Research may or may not result in the adoption of a particular policy and this can be easily observed by a qualitative study of the impact of research. All the studies reported in Table 10 have documented a policy change of some type ranging from the determination of state trade tax to the community based management of resources.

One problem with this analysis is that, as discussed earlier, it is based on a reductive view of the effects of research on policy. Not all effects of research are observable in the short term and in the area investigated. Most importantly, it is difficult to attribute a particular policy to research because there are a series of other intervening factors that influence the policy decisions made. This attribution problem is often overcome by using surveys among policymakers, and this is the approach followed by Babu (2000), Ryan (1999), and Shedeed (2008).

Surveys of main stakeholders ask directly to what extent they believe the policy change was produced by research among a number of other competing factors. There are two main problems with this methodology. First, it is not clear what should be the sample size and what should be the characteristics of the persons interviewed in order to obtain representative responses. Secondly, it is not clear how the attribution of policy change to research should be elicited from the survey responses.

To date the strategy adopted by researchers has mainly consisted of interviewing small samples of non-randomly selected policymakers and of asking them probabilities or subjective percentage contributions of research to policy. There is surely much that could be done to improve the sampling methodology and the framing of the questions in order to build what seems to be a crucial element of an evaluation of the impact of policy research. For example in health policy, the systematic review of Innavear *et al.*, (2002) on health policymakers' perceptions and use of evidence identified 24 studies globally that met their methodological criterion from a search of more than 3000 possibly relevant studies.¹¹ Only 4 of the 24 studies

¹¹ The criteria for inclusion in the systematic review were as follows (p. 240): studies that included interviews with health policy decision makers; studies that included health policy formers responsible for decisions on behalf of a large organisation or jurisdiction; if others were interviewed – most often researchers – decision makers had to be explicitly defined as a sub-group within the study; studies of clinical decision making for individual patients were excluded; the studies had to address decision

were conducted in developing countries (see table 11) and serious methodological concerns were raised throughout the systematic review not least as many authors did not discuss methodology in terms of choice and size of sample, types of respondent and types of policy decisions.

Table 11. Health Policymakers' Perceptions and Use of Evidence in Developing Countries

Authors	Trostle <i>et al.</i> , (1999)	Hilderbrand <i>et al.</i> , (2000)	Lavis <i>et al.</i> , (2000)	Moodley <i>et al.</i> , (2000)
Country	Mexico	Pakistan	Burkina Faso	South Africa
Date of interviews	1994-5	1998	1999	2000
Number of interviews	67	16	Not stated	Not stated
Objective	'The relationship between health research (and researchers) and health policies (and policymakers) in four vertical health programmes in Mexico (p. 104)	The role that research plays in experiences in linking research and policy (p. 77)	A case study on how research played a role in decision making about 'shared care' for childhood illness (pp. 19-20)	Barriers against and mechanisms for improving the vitamin A research-policy connection (p. 55)
Types of decisions (hypothetical, perceived or actual)/types of policy	Perceived use of evidence concerning AIDS, cholera, family planning and immunization in governmental programmes (p. 103)	General perceptions. Closest focus on child health problems such as co-trimoxazole, maternal mortality, vitamin A, breastfeeding and polio. (pp. 77, 79).	Perceived use of the provided scientific information in decision making (p. 20)	Perceived use (p. 55)

Source: Adapted from Innvaer *et al.*, (2002:244a-g).

Common facilitator/driver factors to policymakers' use of 'evidence' were identified in only three of the five developing country studies (Moodley *et al.*, 2000; Trostle *et al.*, 1999) and barriers in all five studies.¹²

makers' use of research evidence in health policy decisions or on a broader range of policy decisions if these included health policy decisions.

¹² Facilitator/driver factors were typically the inverse of impediment/barrier factors. Barriers identified across the five developing country studies are factors which relate to both the supply for and demand for evidence. For example, *factors relating to both the demand for and the supply of evidence*: Although the separation of researchers and policy makers is less absolute than it once might have been there is still a very strong sense of differing incentives and mutual distrust between researchers and policy makers (and often the absence of personal contact) and the notion of 'different worlds' of

6d. The preconditions for policy change

The causal link that runs from research to policy can be further disaggregated by seeking the reasons that make research more or less likely to be translated into policy. It would seem that in order for research to effectively influence policy two conditions should be met: research should reach policymakers and policymakers should value and understand the results of research.

Following Weiss and Bucuvalas (1980) two broad categories of factors make research more relevant to policymakers: quality and action orientation. Weiss and Bucuvalas, (1980) after performing an extensive literature review and pretesting with policymakers, further disaggregate these two categories in a number of potential indicators. Quality can be measured, for example, in terms of objectivity and unbiasedness; statistical sophistication; consistency of findings; generalisability of results; and data-supported recommendations. Action orientation can be assessed, for example, by looking at the presence of simple recommendations; analysis of policy variables; targeting; immediate applicability of findings to current operations.

In the case of the 13 impact studies reviewed, a number of indicators could be developed in order to assess the quality of the research conducted. The potential effectiveness of research in reaching policymakers could be then assessed either on a quantitative or qualitative basis. A score sheet could be produced in order to evaluate each study on the dimensions of quality and action orientation outlined above.

A second prerequisite for effective policy-oriented research is the receptivity of policymakers. Policymakers' attitudes towards research can affect the policy success of research in at least three ways. First, policymakers may simply not value the advice provided by research against inputs coming from other areas, like for example interest groups. Second, policymakers may be biased to appreciate research that confirms their own beliefs or research that defies the status quo, independently of the quality of the research and the rigour of the evidence provided. Third, the policymakers' ability to interpret the evidence produced by research may vary considerably. The cognitive psychology literature is full of examples of 'belief perseverance', consisting of people adherence to theories well beyond what evidence would suggest, and of biases in the causal interpretation of facts (see for example Gilovich *et al.*, 2002; Nisbett and Ross, 1980).

A quality assessment of the change in attitudes and perspective of policymakers after the production of research is documented to some extent by all the 13 evaluation projects reviewed. What is suggested here however is rather different.

researchers and policy makers; *factors related to the demand for evidence*: The nature of political instability in governments and a high turn over of policy making staff and *factors relating to the supply of evidence*: The nature of packaging or use-ability of research and the limited relevance, clarity in recommendations and timeliness of research. Furthermore, the poor quality of available research to base policy on.

Policymakers' valuation of research could be assessed through surveys that test the relevance attributed to research directly against other sources of influence. Similarly, surveys could assess policymakers' preferences for theory confirming existing beliefs or challenging the status quo. Finally, the understanding on scientific information by policymakers can be assessed through behavioural experiments. These are clearly beyond the scope of a project evaluation, but there is a large and rich literature in cognitive psychology and behavioural economics from which evaluations could draw valuable insights.

6e. Some examples

We present here typical examples of impact evaluations for some projects:

Example 1: A project that aims to increase the size of public spending in agriculture and improve efficiency of spending, by conducting analytical reviews and modelling exercises of the effect of increased expenditure on the economy.

Table 12 sketches the theory underlying such a project together with a number of possible performance indicators. The project is based on the assumption that economic growth is prevented by the low level of public expenditure in agriculture.

In this case, the welfare outcomes – increase in household incomes and poverty reduction – are easily measurable because the project produces both the data and the methods (simulations) required for their measurement. Since much of the project consists of modelling alternative expenditure scenarios, several counterfactuals will be built by simulation against which the project outcomes can be assessed.

The crucial element of this evaluation consists of showing that the policy measures adopted by governments are a direct consequence of the research input provided. Analyses of the quality of research produced and of perceptions of political leaders could be produced. However, it seems more fruitful to design a survey that captures policymakers impressions of the relevance of the research conducted in determining the decision-making process.

Table 12 Programme theory

Theory of Change	Indicators
<p>Rationale</p> <ul style="list-style-type: none"> • A high-level agreement for providing higher support is needed for agriculture • Public expenditure in agriculture is currently very low • Agricultural growth is good for general economic growth and poverty reduction 	<p><u>Context:</u></p> <ul style="list-style-type: none"> • Level of commitment of governments to the agreement • Level of agricultural expenditure as a share of total expenditure and GDP • Historical accounts and econometric studies of the impact of agricultural growth on economic growth and income distribution

<p>Successful project action is to,</p> <ul style="list-style-type: none"> • Conducting analysis of public expenditure on agriculture • Producing models that establish the links between public expenditure in agriculture and welfare 	<p><u>Inputs (monitoring)</u></p>
<p>Project outcome,</p> <ul style="list-style-type: none"> • Rigorous analysis of public expenditure needs in agriculture 	<p><u>Outputs</u></p> <ul style="list-style-type: none"> • Quality of the evidence produced by the studies
<p>Initial success,</p> <ul style="list-style-type: none"> • Policymakers are convinced by the evidence provided by the analysis 	<p><u>Outputs</u></p> <ul style="list-style-type: none"> • Policymakers perceptions of relevance of the studies
<p>Ultimate success,</p> <ul style="list-style-type: none"> • Governments increase and improve financing and administration of public expenditure in agriculture 	<p><u>Policy change</u></p> <ul style="list-style-type: none"> • Changes in the public budget shares allocated to agriculture • Changes in tax and transfers in a pro-agriculture and pro-poor way
<p>Overall Goal,</p> <ul style="list-style-type: none"> • Economic growth and poverty reduction 	<p><u>Welfare outcomes</u></p> <ul style="list-style-type: none"> • Household income • Poverty

Example 2: A project to develop a soil health surveillance system with an aim to improve soil management.

The programme theory for such a project, summarised in Table 13, assumes that there is little data available supporting soil health management and that the production of this type of information, together with testing methodologies and capacity building, will generate a better management of soils that ultimately will result in higher productivity and incomes of rural households.

The ultimate test of project success would be an increase in crop yields which would bring about poverty reduction in rural areas. Since data on yields and policy interventions would be routinely generated by the project, it should be perfectly feasible assessing program impact by comparing yields of similar geographic areas (by agro-ecological and socioeconomic characteristics) where recommended policies have and have not been adopted. Data from mapping soils could be integrated with other data including agro-ecological and socioeconomic characteristics which allows the generation of counterfactuals for program evaluation at the aggregate level.

A second line of project assessment would be to observe changes in policies by the target beneficiaries of the project. Changes in farming systems before and after the project can be interpreted as a result of project interventions. A survey of potential users of the research information could be used as a baseline of participants and non-participants.

Follow-up surveys can measure the extent of use of the soil information provided and the type of practices and recommendation provided. Qualitative studies may investigate why information on soils is differently accessed or used to inform policies in different ways by farmers' organisations, agro-dealers and project managers.

Table 13 Programme theory

Theory of Change	Indicators
<p>Rationale</p> <ul style="list-style-type: none"> • Lack of data on soil health • Poor soil management • Poor agricultural productivity 	<p><u>Context:</u></p> <ul style="list-style-type: none"> • Old and unorganised data on soils • Uninformed decision making • Inefficient technologies in use
<p>Successful project action is to,</p> <ol style="list-style-type: none"> a) Establishing a consortium b) Creating a data management system c) Develop digital soil maps d) Test soil management interventions e) Capacity building 	<p><u>Inputs (monitoring)</u></p>
<p>Project outcome, <u>information on soil health</u></p>	<p><u>Outputs:</u></p> <ul style="list-style-type: none"> • Technology packages identified • Soil health diagnostics • Tested practices
<p>Initial success, <u>better soil management</u></p>	<p><u>Policy change:</u></p> <ul style="list-style-type: none"> • Better targeting of interventions • Soil management initiatives • Change in practices within agricultural project
<p>Overall Goal, <u>reducing rural poverty</u></p>	<p><u>Welfare outcomes:</u></p> <ul style="list-style-type: none"> • Yields of main crops • farm incomes

Example 3: A project aiming to generating knowledge that will help public and private investors in agricultural technology to make decisions that reduce poverty in a cost-effective way.

The programme theory is outlined in Table 14 together with a number of potential indicators for tracking success. The project is based on the assumption that the data to perform this type of analysis is available as well as the models and the evaluation tools to generate alternative predictions. The ultimate project goal is an improvement in the living conditions of the poor through an increase in agricultural productivity. Given the time horizon of the expected project output, this outcome can hardly be observed and attributed to the project even in the very long term.

In order for the program to be successful, two conditions have to be met. First, the project must produce reliable predictions of the effects of alternative technological investments on the welfare of the poor, and it must also be able to provide indications to prioritise investments. Second, the knowledge produced by the project must be understood by private and public decision-makers and put to use.

One main problems of assessing (a) the quality of the predictions and priorities, and (b) the influence on decision making, is the lack of a valid counterfactual. Two options seem to be available. The first consists of comparing (a) and (b) of a single institution to those of another institutions operating in technological agricultural development. The second consists of using past policies as the counterfactual within each organisation. This means simply comparing (a) and (b) before and after the project.

Table 14 Programme theory

Theory of Change	Indicators
Rationale 1. Data and models to assess the effects of investments in agricultural technology are unexploited	<u>Context:</u> <ul style="list-style-type: none"> • Availability of data on agriculture, welfare and markets • Models and evaluation methods to predict the effects of technological investments
Successful project action is to, f) Analysis of commodity production g) Commodity linkages to welfare of the poor h) Productivity constraints analysis i) Technology audits j) Technology assessment k) Communication and outreach	<u>Inputs (monitoring)</u> <ul style="list-style-type: none"> • Databases • Working papers • Economic models • Evaluation tools
Project outcome, <u>technological investment options</u>	<u>Outputs:</u> <ul style="list-style-type: none"> • Predictions of outcomes of technology investments • Priorities set
Initial success, <u>access and use of knowledge for decision making</u>	<u>Outputs:</u> <ul style="list-style-type: none"> • Policy shifts in promotion of agricultural productivity • Technological investments by a specific institution • Technological investments by private and public investors
Ultimate success, <u>technology investments</u>	<u>Outputs:</u> <ul style="list-style-type: none"> • Technology adoption • Yields • Agricultural income

Overall Goal, <u>welfare</u>	<u>Outcomes:</u> <ul style="list-style-type: none"> • Rural households income • Child nutrition
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Regarding the methods to assess the quality of predictions and the priorities set, a survey among a number of scientists and experts in the field might be helpful. The main output produced by the project could be reviewed by a panel of selected experts to see whether it delivers what it promises. An assessment of the project influence on decision-making could be performed by means of a standard survey questionnaire among key decision-makers within the institutions that the project expects to influence. The survey should reveal a change in the methods used in making decision (as they are informed by the project) and a change in investment practice.

7. CONCLUSIONS

We identified three main reasons for assessing the policy impact of research: auditing, learning and cost-effectiveness analysis. Impact assessment of policy research will help ascertain:

- whether a particular project has the desired impact on policy (auditing)
- what are the main factors affecting programme success and failure (learning)
- what is the cost of achieving the outcomes compared to other interventions (cost-effectiveness)

Programme assessment along these lines will help programme managers to discontinue ineffective programs, to improve the operations of future interventions, and to choose among alternative interventions having the same goals. Exploring conditions to improve existing evaluations of welfare impacts of policy interventions is highly desirable.

The review of the agricultural research impact studies and the examples suggest that there is no standard practice for the evaluation of research projects and that every evaluation strategy should be designed on a case-by-case basis. The review however also concluded that, provided we are willing to accept some assumptions, it is possible to test research project impacts along some dimensions of project operations by finding the appropriate indicators (and methodology). The overall goal - welfare impacts of research - is highly desirable but not always feasible. This type of assessment is made difficult by the time lag in the occurrence of welfare effects after the interventions, the availability of data to measure project effects or to perform simulations, and the theoretical problems of building a valid counterfactual and of identifying the determinants of success.

While we have very limited control on the timing issue of programme evaluation and on the solution of its theoretical problems, there is much that could be done in terms of production and dissemination of data for evaluation research. The databases managed by the World Bank and the IFPRI are good examples of the benefits of data sharing. The Living Standard Measurement Studies databases of the World Bank have been used by hundreds of researchers around the world and have contributed enormously to the understanding of the welfare effect of policies in developing countries. Similarly, the bank of project datasets ran by IFPRI has been at the origin of many publications that have increased our knowledge of the effects of development programs.

When a welfare assessment of research projects is not feasible, it is recommended that evaluators test intermediate project outcomes. The articulation of the theory of change of the project allows testing critical links in the causal chain running from research to welfare. In particular, what emerges from the review is the need to assess the impact of research on policy change. More effort should be spent in designing surveys of policymakers that allow a more accurate attribution of a given policy to research.

Finally, when the research-policy attribution problem is not easily approachable, an alternative method of assessing impact consists of testing the presence of fundamental preconditions for the success of research in influencing policies. The review suggests that an analysis of the 'quality' of research produced and of policymakers' perceptions is crucial to this end.

ANNEX 1: RESEARCH ON POLICY PROCESSES

The following is extracted from Sumner and Harpham (2008):

Research relating to decision-making in public policy processes has evolved from Northern contexts since Lasswell and Lerner (1951) and particularly so in the 1970s/1980s (see for examples, Etzioni, 1976; Hogwood and Gunn, 1984; Lindblom, 1959, 1979; Pressman and Wildavsky 1973; Wildavsky, 1980). Such research has been expanded to Southern contexts over the last two decades (see for examples, Brock and McGee, 2004; Court and Young, 2003; Grindle and Thomas 1980; Holmes and Scoones, 2000; Keeley and Scoones, 2003, 2006; Leach *et al.*, 2005; Thomas and Grindle, 1990; Walt, 1984; Walt and Gibson, 1994). Assumptions regarding policy-making processes have been challenged, particularly so in Southern contexts – notably those relating to rationality and linearity of policy processes (see for further discussion Stone *et al.*, 2001).

The net result is that there are now a bewildering array of theories and analytical frameworks of policy processes. First generation models in the 1950s/60 took only a limited account of power per se in rational and linear models that largely assume a certain kind of functioning democracy. For example, the older rational models noted (e.g. Lasswell, 1951), bounded rationality models (e.g. Simon, 1957), incrementalism and/or disjointed incrementalism models (e.g. Lindblom, 1959). Second generation models more explicitly dealt with power. There was also expansion from considering state actors and their political or bureaucratic interests and capacities to non-state actors and networks and a shift from linearity and stages, to iterative processes and to spaces. Examples include the middle ground or mixed scanning models (e.g. Etzioni, 1976), garbage can theories (e.g. March and Olsen 1976), interceptor/receptor models (e.g. Hanney, 2005), the three inter-connecting streams model (e.g. Kingdon, 1984), the political economy approach of de Janvry and Subramanian (1993), the ladder of utilization and receptors receptivity model (e.g. Knott and Wildavsky 1980), the interactive or problem solving/engineering models (e.g. Grindle and Thomas, 1991), the Research and Policy In Development (RAPID) research-into-policy model (Crewe and Young, 2002), the argumentative model (e.g. Fischer and Forester 1993), and the Structuration or KNOTS-discourse based model (e.g. Keeley and Scoones, 2006; KNOTS, 2006). Most recently there is the 'new development anthropology' that takes 'policy' as an organising concept that shapes how people live, think and act and seeks to not only examines the language of policy/power but also seeks to investigate its institutions, processes, effects and practices ethnographically – the internal dynamics of donors and 'donor' land are recent examples (see for example Mosse, 2004).

We can identify three common domains of interest in a synthesis approach: the *policy actors*: The policy actors and networks and their political interests and incentive/disincentive structures (i.e. power as material political economy); the *policy narratives*: The policy narrative/discourses and their underlying evidence or knowledge (i.e. power as discourse); and the *political context*: The context and institutions and how the socio-economic, political and cultural environment shapes policy processes and the formal/informal 'rules of the game' (i.e. power as

institutions or habitus). Underlying each of the three domains is an assumption. Respectively, that there is an unclear line between those who 'make' policy and those who 'influence' policy, policy processes are likely to be non-linear and highly iterative and that 'evidence' used in policy processes is contestable rather than positivistic.

ANNEX II. RESEARCH ON RESEARCH IMPACT

The following is extract from Sumner *et al.*, (2009):

There is no single recipe for influence/impact but there are ingredients that stand out as being important. These include factors that inhibit (barriers/impediments) and facilitate (facilitators/drivers) research influence/impact. Some relate specifically to the influence/impact of research on policy and some are more general. Different studies are predicated on various assumptions, types of impact/impact and instrumental or conceptual frameworks. Some utilise frameworks which focus on policy processes rather than on research use/outcomes themselves. Some seek to capture types of research influence/impact, while others seek to capture the processes through which the impact/influence occurs. Some are descriptive or analytical; others are normative. Some offer a micro-len, relating to research usage in stages (e.g. the linear models of Knott and Wildavsky, 1980; Landry *et al.*, 2001), while others are iterative and focus on 'non-decisional processes' (e.g. Weiss, 1980, 1982) and 'percolation' processes. Highlighting the iterative nature of percolation, recent models focus on researcher and research user interactions, notably in the health research and policy arena (e.g. Hanney, 2002; Lavis *et al.*, 2003; Molas-Gallart *et al.* 2000).

Notwithstanding the diversity in the literature, three domains or clusters of factors emerge. These are:

'Messaging' or the content and processes of knowledge generation and translation. These refer to the engagement and participation of users of research at the outset and during the research (McNeill, 2006; Jones, 2005; Neilson 2001; Ryan & Garrett, 2003; Sumner and Harpham, 2007). In this context, there is an effort to craft what Gladwell (2000) calls 'sticky messages' in narratives and 'stories' that are not only memorable but credible and also adaptable via 'translation' for different audiences.

'Networking' or the connecting to and working with networks and the importance of building coalitions or 'knit working' groups (Hovland 2005; Jones, 2005; Molas-Gallart & Tang 2007, McNeill 2006; Ryan & Garret 2003; Sumner & Harpham 2008). Networks are a crucial element of research influencing as is a common advocacy strategy of building coalitions for change along the lines suggested by Gladwell's (2000) 'law of the few' where ideas and change are spread by those who are connected or part of wider movements.

'Opportunism' or the 'the power of context' (Gladwell 2000). Influence and change often need a conducive environment in terms of context for influence or change to result (Hovland 2005; Neilson 2001, Molas-Gallart & Tang 2007; Sumner & Harpham 2008; Ryan & Garrett 2003). Researchers can search for windows of opportunity via

strategic opportunism, i.e., the systematic identification of good opportunities to enhance impact/influence whilst acknowledging that change may be non-linear, iterative and complex, opportunities are often visible to those who know how/where to look.

ANNEX 3. RESEARCHING POLICY IMPACTS ALONE

Table A1. How studies have approached researching the policy impacts of agriculture research

Policy Reference	Type of policy change	The 'what' Policy impact indicators (and the counter-factual)	The 'how' - Methodology and methods	The 'when' - Type of assessment and timing
Rationing (RR) program in Bangladesh Babu (2000)	Policy content impact - Rural Rationing Programme abolished	People's perceptions of the contribution (influence, value and impact) of IFPRI's research to the policy change and people's perceptions of what would have happened without IFPRI's research	Qualitative 65 semi-structured interview with donors, collaborators, policymakers, and participants in the BFPP training courses Review of project documents	Impact Assessment Closure + elapsed time (6 years)
Food for Education program in Bangladesh Babu (2000)	Behavioural changes in policy implementation impact - Programme expansion to other unions	People's perceptions of the contribution (influence, value and impact) of IFPRI's research to the policy change and no counter-factual	Qualitative Interviews with donors, collaborators, policymakers, and BFPP participants in the training courses. Review of project documents	Impact Assessment Closure + elapsed time (4 years)
In-Trust Agreement between FAO and CGIAR Gotor (2008)	Policy framing impact - Agreement reached and signed between FAO and CGIAR	Participants perception of the role of Bioversity in establishing ITA and participants perception on counterfactual (what would have happened without the research)	Qualitative 16 key informants interviews 'Triangulation' and review of documents	Ex post evaluation Closure + elapsed time (6 years)
Pulp and Paper Policy in Indonesia	Policy procedural impact - Ministerial Decree adopted requiring mills to source all wood	Participants perception influence, contribution and attributive impact of CIFOR's research and Interview response on	Qualitative 31 key informant interviews with representative of 16 distinct	Ex post impact Assessment

Raitzer (2008)	from plantations by 2009.	counterfactual (what would have happened if all other players were active, but without CIFOR research).	organisations.	Closure + 6 years
Barley Fertilisation Policy in Syria Shideed <i>et al.</i> , (2008)	Behavioural changes in policy implementation impact - New fertilizer allocation policy adopted	Participants' perceptions of how the policy change has taken place and the role of different institutions involved in the change. Counterfactual on farmers' practices before the policy change and how fertilization policy would have evolved in absence of POR.	Qualitative 18 Interviews with partner institutions, stakeholders and policy-makers	Ex post evaluation Closure + 17 years
PROGRESA Anti-poverty and Human Resource Investment Conditional Cash Transfer Programme in Mexico Behrman (2007)	Policy framing impact - Continuation of the PROGRESA antipoverty and human resource programme	Participants' perception IFPRI's influence on the design of PROGRESA and its contribution to the program and spillovers. No counterfactual.	Qualitative 39 interviews with major participants in the program and its evaluation (through in-person, telephone or email). Review of documents	Impact Evaluation During programme
Dairy Marketing Policy in Kenya Kaitibie <i>et al.</i> , (2008)	Policy procedural impact - Revised Kenyan dairy policy adopted	Participants' perception on the policy change process and its implementation. Policy-makers and researchers response on counterfactual (how long it would have taken for the policy change to occur without SDP)	Qualitative Field interviews with 61 milk traders, 5 field regulators. Interviews with policy-makers, SDP researchers, and NGOs. Review of SDP publications between 1997 and 2005	Ex post impact Assessment Closure + time lapse (2 years)
Pesticide Package Programme	Policy content impact - Policies regulating highly toxic	Economic benefit of the PPP and participants perception on the	Mixed (Qualitative and	Ex post impact Assessment

(PPP) in Philippines Templeton and Jamora (2008)	insecticides in rice implemented	factors that brought about or influenced the government's decision to change the policies on pesticides and pest control practices No counterfactual	Quantitative) Key informant interviews with policymakers and stakeholders, Media review	Closure + elapsed time (16 years)
Community-based Fisheries Management (CBFM) in Bangladesh Pems <i>et al.</i> , (2008)	Behavioural changes in policy implementation impact - Awareness of and attitude towards community-based fisheries management spreading amongst key stakeholders	Participants perception on how far recent changes in the awareness and opinion of key agencies and policy-makers, as well as the content of new policy documents, can be attributed to the CBFM project. No counterfactual	Qualitative Expert face-to-face interviews with 26 selected experts. Written survey sent out via email to 32 experts from various institutions related to the project, 21 responded. Social Network Analysis	Impact assessment Closure
Rice Marketing Policy in Vietnam Ryan (1999a)	Policy content impact - New Rice Marketing Policy in Vietnam	Partners and stakeholders' perspective of the value, influence and impact of IFPRI research. No counterfactual	Qualitative Interviews by an independent consultant with 35 officials and stakeholders.	Impact Assessment Closure + elapsed time (1 year)
Community based food security and capacity building in Malawi Ryan (1999b)	Policy framing impact - Awareness within the government of Malawi of the need for community-based food security and monitoring systems.	Partners and stakeholders' perspective of the value, influence and impact of IFPRI programs: training, capacity strengthening and policy research activities. No counterfactual	Qualitative 52 Interviews by an independent consultant with various partner institutions and stakeholders (most in person, and a few over telephone and by email).	Impact Assessment Closure
Greywater Reuse in Jordan Surani (2003)	Policy procedural impact - Revision of the National Housing Codes and formation of a national committee to formulate	Project leaders, beneficiaries and government officials' perspective on the influence of IDRC supported research projects on	Qualitative 27 Key Informant Interviews with project leaders, project	Evaluation Study Closure

	Greywater Reuse Guidelines	public policy. No counterfactual.	participants, government officials, project beneficiaries and IDRC staff. Documents review Triangulation	
Urban Agriculture Ordinances in Uganda Hooton <i>et al.</i> (2007)	Policy content impact - A set of 5 Urban Agriculture Ordinances passed	Analysis of actors, events and influences affecting a policy change through key actor's perspective, review of documents and timeline of key events. No counterfactual.	Qualitative Combination of episode study, case study and outcome mapping. Literature review and commissioned timeline of key events; 20 key actor' 'interviews; workshop to map out behaviour changes of key actors and finalise a map of key events and influences; and follow-up interviews and literature search to cross-check findings.	Mixed approach. Closure + Elapsed time (since there are various pieces of research the exact number of years varies).

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