

# Briefing Paper

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## Use of Impact Pathways by the CPWF

December 2006

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## Purpose

This paper sets out the ways in which impact pathways (IP) are used as management tools for channeling information and assessing quality by the Challenge Program on Water and Food (CPWF). The phrase “impact pathways” is taken to mean an attributable sequence of cause and effect that links research activities and their resulting outputs, through outcomes represented by the external adoption or use of research findings, to impacts in terms of social, environmental or economic benefits to the target communities.

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## Why examine impact pathways?

Impact pathways analysis is a methodology that can encourage projects to become more impact oriented and promote their capacity to demonstrate that impact by testing the theories which drive project activities. The CPWF strives for a high level of impact orientation, which means that managers and staff appreciate that the Program and its projects are being evaluated, not just on the *delivery* of research outputs, but on how those outputs are *used*, by whom, and to what effect. The CPWF will be judged successful to the extent that it can demonstrate that the research it has supported has, to an appreciable degree, “increased the productivity of water for food and livelihoods, in a manner that is environmentally sustainable and socially acceptable” in and beyond the river basins in which it works (to quote from the stated objectives).



*Fig. 1 An Impact Pathway Workshop in the IGB Basin*

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## Background

Like many recent research and development programs, the CPWF was designed using a simple series of hypotheses based on premises such as, “if research is done and certain other conditions are met, leading to this output, then that outcome will be achieved”. This was initially expressed through a standard logical framework, using

activities, outputs, purpose and goal in the vertical dimension, and tasks, indicators and assumptions in the horizontal dimension.

Attempts to use this format as a management tool were not entirely successful mainly because the log-frame format was too restrictive. Logical framework analysis does not have the scope nor the flexibility to cover both the research *and* the development aspects of this kind of program. In the CPWF there were simply too many links in the chain of cause and effect, giving rise to logical gaps in the very framework that was supposed to clarify the linkages. Moreover, the assumptions about external factors were insufficiently robust and extensive to demonstrate how these influences increasingly diverge beyond the immediate control of the Program. As a result of these weaknesses in the traditional log-frame, the CPWF was already moving towards an impact-oriented approach when the Science Council moved from the traditional format of the logical framework in favour of an output-outcome-impact table, for the Medium Term Plan 2006-08. CPWF therefore welcomed this move and the help it provided the Program to utilize an impact pathway approach more centrally in its management system.

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## The Impact Assessment Project and its contribution

A missing link identified early in the Program was a scientific framework for evaluation and outreach (scaling out & up) of the interventions developed in projects, to assess their potential impact within and across basins. This led to the creation of a



Fig. 2 An Impact Pathway timeline exercise in Laos

series of support projects for the benchmark river basins that are the key geographical focus of CPWF research. These Basin Focal Projects (BFP) coordinate strategic research that links project and basin activities towards the global demands for research, and in effect help to ensure that CPWF products are more applied and less purely academic in nature, with greater added value from the portfolio of projects.

One of the objectives of the BFP is to provide a compelling *ex ante* analysis of the types of impact CPWF research can help bring about. *Ex ante* impact assessment is consequently central to the whole BFP concept and requires a

special emphasis in itself. As part of the BFP sub-program (i.e. MTP-level project), an Impact Assessment Project was therefore contracted to help create a clearer vision for the CPWF by identifying, quantifying and describing some of the potential impacts and international public goods that the CPWF is generating, and to develop impact assessment and evaluation methodology for use by the basin-specific focal projects and the CPWF in general. This project has helped the Program by providing a catalyst and trial arena in the development of methodology for this approach.

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## Synthesis of the impact pathways approach

The impact pathways approach is based on concepts related to program theory drawn from the fields of evaluation, organizational learning and social network analysis. As a result, its core narrative combines both logic model and network mapping into a single explanatory account. This provides a plausible explanation of anticipated program effects by explaining the steps in the logic model, who does what, and the key external events that are needed to ensure that outputs lead to outcomes, and outcomes give rise to impacts. In the case of the CPWF, the approach clarifies and improves program theory by making the steps explicit, challenging and refining the implicit theories of individual staff members as to how things happen, moving towards a shared understanding, and thereby better guiding how they communicate with one another and how they act in pursuit of Program goals. The impact pathway approach also works well on the smaller scale of the contracted research projects, which have their own breadth and complexity.

The impact pathways (IP) logic model goes beyond the normal use of traditional log-frame models. The CPWF's requirement for project causative theory to be made explicit leads to a requirement that managers and partners describe how project and Program research outputs are adopted and put into use. There has been an increasing recognition among agricultural research-for-development professionals that two types of adoption are important: scaling-out and scaling-up.

Scaling out refers to the increasing adoption of project outputs from farmer to farmer, or community to community, within the same stakeholder groups. Scaling-up refers to a vertical institutional expansion based largely on first-hand experience, word-of-mouth, and positive feedback from adopters to policy makers and the other stakeholders. Scaling-up is key to building a more enabling environment for the scaling-out process.



*Fig. 3 A network map in an IP workshop in Ghana*

Complementing this, the network maps describe the arrangement of partners and stakeholders who will produce the outputs and outcomes shown in the IP logic model, both during the research itself and later as the results are scaled out and up. Timelines are also key elements of the pathway, adding further quantification as far as it can be predicted or estimated.

## Project impact pathways in practice (as used with CPWF-contracted research projects)

In practice, under the CPWF approach, project impact pathways are described in terms of the IP logic model and network maps. The impact pathways model is a

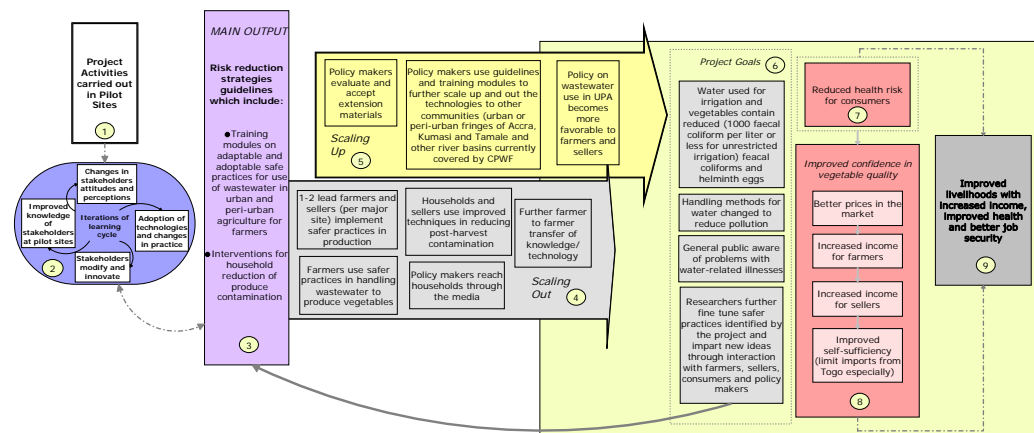


Fig. 4 IP Logic Model for the Safer Vegetable Production and Wastewater Irrigation Projects

flowchart that shows the chains of outcomes that link outputs to eventual developmental impacts, while the network maps give more details of the causative theory in terms of required partnering arrangements, direct and indirect beneficiaries, and the proportion of beneficiaries over which the Program wishes to spread its resources. The impact pathways approach builds on an innovation systems perspective that recognizes that scaling-out and up are brought about by the formation and actions of networks of stakeholders in what is essentially a social process of communication and negotiation. A vision of the future (post-project) network is essential for the project to achieve eventual impact, because it is necessary to demonstrate that there is a system to utilize project outputs after the end of the project. Making explicit the required future network helps build a project's causative theory.

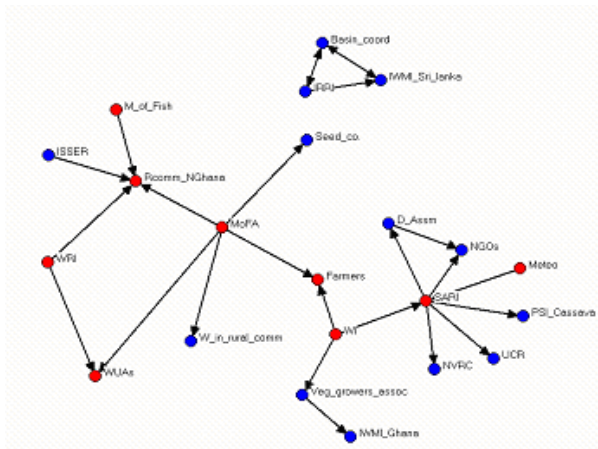


Fig. 5 A network map for the Strategic Innovation in Dryland Farming Project.

The network maps describe the “softer” behavioural and relational aspects of a project’s impact pathways, complementing the “harder” mechanistic description given by the logic model. The network maps also help compensate for a weakness of logic models that do not give sufficient information about the actors involved in bringing about developmental change. In addition, logic models often give the impression that there is just one impact pathway and that there is a higher degree of certainty about

how the future will unfold than actually exists. However, agricultural development comes about through complex and non-linear processes, which is a feature recognized by and captured in network maps.

The relationships between the outcomes in the IP logic model and the network maps are woven together by an impact narrative. The preparation of the narrative subjects to critical scrutiny the assumptions on which the project is based. This scrutiny helps project managers and staff to develop a better-grounded, more robust and complete impact pathway for their project.

Two techniques are then used to quantify, as far as is reasonable, the likely intermediate and final outcomes and impacts. These are geographic extrapolation domain (GED) analysis and scenario analysis. Simply stated, GED analysis helps identify where one would expect a technology to be adopted. It uses “weight of evidence” techniques to calculate where one is likely to find areas with similar socio-economic and agro-ecological conditions as found in CPWF project pilot sites, to determine, *ex ante*, the sites most likely to offer the potential for successful adoption of research products and services generated by the Program’s research. With this information, the project and the CPWF can plan to scale out to areas that offer the greatest likelihood of success so as to augment and maximize their impact and thereby optimize the effectiveness of research funding.

Scenario analysis allows for the inclusion of unexpected developments outside currently existing boundary conditions. It is used to quantify project impact pathways over a 25-year time scale, through use of an existing water and food supply and demand quantitative modeling framework called IMPACT-WATER. The framework allows economic policies and climate outcomes of other basins and regions to be taken into account when building scenarios for the impact of different project research outcomes.

## Limits to the CPWF's delivery responsibilities

Since the CPWF is a research-for-development program, an evaluation of its impact seeks assurances that its research will be transformed into developmental impact; but the Program itself does not have the resources required to achieve this alone. Here partnerships and integration with development agencies are relied on. This must be at multiple scales: for example, large non-governmental organizations might help implement field-level or catchment outputs, while governments, perhaps with multilateral bank lending support, must take up national or basin level outputs. The Program itself cannot commit to delivering impact, though it must contribute to others' abilities to do so.

Despite this limitation, the fact is that simply by providing a presence during the research period, the Program is influencing change. There are numerous instances where, at one scale or another, the CPWF's research projects are integrating their systems effectively into local authority structures. The implication is that the Program is already delivering developmental impact at some level. But the researchers themselves play no direct role in the implementation of the outputs, only in their adaptation to local needs and transfer. The projects provide tools and a network (which includes the local authorities), and encourage but cannot enforce integration.

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## CPWF programme-level impact pathways in practice

At the program level, a broader and less precise view of impact pathways is taken, appropriate to the scale of management. This follows the approach adopted for individual contracted research projects, but views the Program's constituent elements on the basis of the MTP-level projects (of which there are currently seven as distinct from the 52 contracted research projects). There are some variations, which are described below.

In the latest MTP (2007-09), the CPWF used objective trees to highlight the impact pathways that are implicit in the standard output-outcome-impact tables, which are in a format specified by the Science Council. In fact, this tabular format is a hybrid, somewhere between representations of the more local program logic and the more broad intended development impacts. Drawbacks of log-frames in terms of impact pathways include (i) the absence of a definition of the development problem being addressed and (ii) the limited number of steps made explicit in the chain of cause-and-effect. Hence a different representation is required to augment the traditional log-frame and so help to clarify the complexity of the logic. Tree diagrams do not adequately provide a clear demonstration of a pathway in black and white on a two-dimensional sheet of paper (the medium of the MTP and assessment reports). Hence

it was decided to use both together. The objective trees are used to demonstrate the pathway in terms of researchable problems and the intermediate and final objectives in their solution. The standard framework is used to show how contracted research projects were linked to the broader outcomes and impacts towards which the Program is moving.

Up until now the networks of stakeholders around the CPWF's various MTP-level projects have been represented only in the form of categorized matrices. This is largely because of the immense number of partners involved in the implementation of the CPWF, and the difficulties implicit in using a diagrammatic mapping format. In terms of demonstrating roles, this is clear, and probably adequate at this level of management. The depiction of numerous inter-connected relationships, as at contracted research project level, is perhaps not so important among the agents of change (at the administrative level) as it is for their links with the beneficiaries of the process (at the field level in the projects).

## Internal organisation

An informal Impact Group has developed within the Program's Management Team, to pilot the approach and share thoughts as it evolves. This combines resources from the core management structure, the monitoring and evaluation elements, and the contracted BFP Impact Assessment Project. These individuals have been active in a range of workshops as well as in preparing appropriate outputs for dissemination.

## Future planned developments

We have found the MTP output-outcome-impact table format too limited in scope to account adequately for the indicators that are needed to monitor progress along the impact pathway. We are therefore developing modifications that allow us to state the markers of intended outcomes and prospective impacts that should derive from the research inputs. Simply defining these provides a form of *ex ante* impact assessment, and additionally, later evaluation of success in reaching the markers provides the basis for *ex post* impact assessment. Timelines, rather than being limited to the output targets only, must also be added for the achievement of anticipated outcomes and impacts. These refinements are necessary to strengthen both operational monitoring and later evaluation to ensure that the entire planning, management and assessment process is co-ordinated, holistic and robust.

When projects make explicit their impact pathways (i.e., program theory) and then monitor and evaluate their progress along them, they are undertaking action research. We expect this action research to allow early identification of both high potential research outcomes, and high potential impact pathways.



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## What is the added value of the impact pathway approach?

The processes of constructing and refining the impact pathways at both Program and project levels help clarify and make explicit (i) the assumed causal linkages between outputs, outcomes and impacts, and (ii) the relationships between partner organizations that are necessary for these to happen. Once developed, the impact narrative improves understanding and communication among stakeholders, making the Program more harmonious. It also makes it more accountable and easier for donors to fund because it presents a cogent, rational and well-founded account of attributable results. It helps with project monitoring and evaluation because it permits managers to compare what they have predicted with what is actually happening. It also helps the stakeholders develop a shared understanding of their project and the wider program, which can help with implementation, in part by identifying and giving focus to high priority activities and relationships. Moreover, constructing impact pathways for the projects in a basin helps Program management staff to identify better the complementarities and synergies between projects, thus contributing more broadly to research and development across the basin and further afield to the whole CPWF and other external activities.

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## Further information

For further information please go to the CPWF Impact Group's Wiki at <http://impactpathways.pbwiki.com>