

3. From research to impacts

A major challenge for CRP5 is to translate rigorous research into robust development outcomes that contribute to poverty reduction and food security while ensuring environmental sustainability.

Although the ultimate impacts of our research will depend upon a combination of political will, transparent systems of governance, and technical, financial and managerial capacity, there are many ways we can work to ensure that our technical and policy recommendations are implemented. Primarily, CRP5 researchers must work closely with strategic partners to ensure policy and management change. Poor and vulnerable groups have little choice when it comes to practices that degrade land, water and ecosystems. Consequently, we must give equal focus to the socioeconomic factors that overcome this lack of choice, including social support systems, in addition to proposing technical solutions.

A central feature of our approach will be to ensure that the exclusion of women and youth from decision-making processes in agriculture and NRM and the benefits derived is addressed more directly. We have therefore given considerable attention to what we term ‘theories of change’ and Impact Pathways, as described subsequently (see Box 3.1 for terminology). This chapter also examines how CRP5 will prioritize its work.

Box 3.1. Terminology

Theory of change: A theory of change describes how a project or program worked, or is expected to work (Weiss, 1995). In our case it explains how we speculate that CRP5 research will bring about developmental outcomes. Theories of change can be expressed in different ways (e.g. as logic models, LogFrames and impact pathways), and at several scales (e.g. project, SRP and Program).

Lever of change: an opportunity for research to lever developmental change together with a description of the strategy and tactics by which the opportunity might be realized.

Impact pathway: The research-to-development continuum; the connections between organizations that turn research into developmental outcomes and provide feedback on what is needed, working and not working.

Next users: the people and organizations that co-develop and use research knowledge for the benefit of the end users.

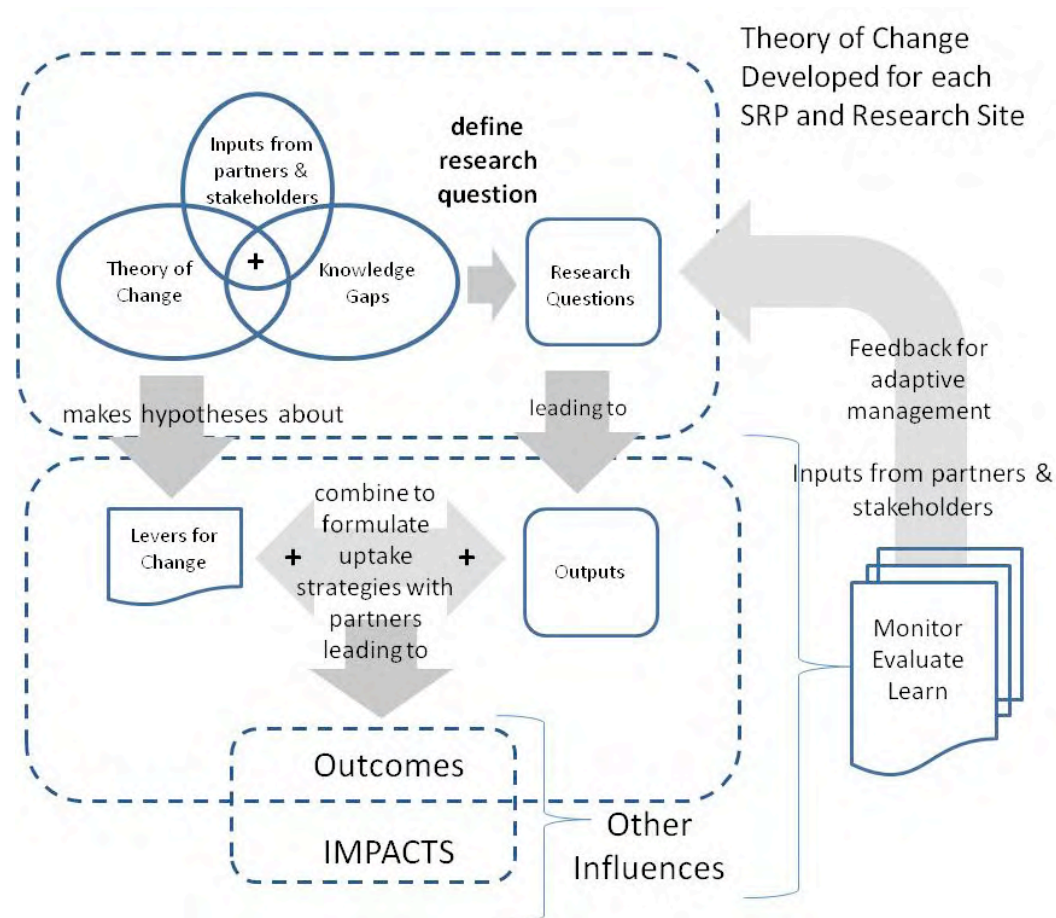
End users: our ultimate beneficiaries – the rural and urban poor whom the CGIAR seeks to benefit.

3.1. Theories of change

A generic theory of change (see Figure 3.1) was used to formulate the CRP5 SRPs. CRP5’s theory of change describes the levers we can pull to bring about the changes we believe will foster sustainable agriculture and healthy environments, and alleviate poverty. Creating impact means changing behavior, be that policy change or farmer adoption. Hence our theories of

change describe how co-developing and communicating research outputs with partners will contribute to behavior change of key actors.

Figure 3.1. Generic theory of change underpinning CRP5 design



Taking a theory-of-change approach implies that, although outcomes and impact are beyond a researcher’s direct control, researchers share a responsibility to strive towards developmental change by linking and collaborating with others.

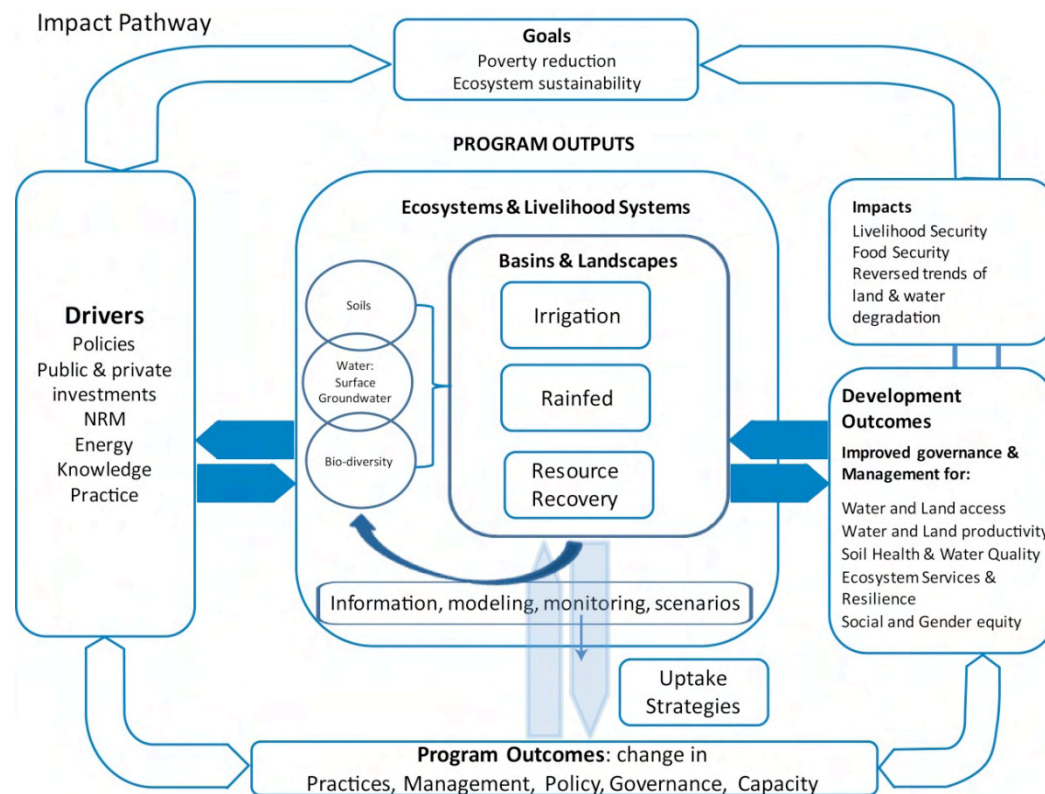
In the process of conceptualizing theories of change and formulating uptake strategies, we consult with our partners and stakeholders and scan the wider environment to see what other influences may help or hinder our efforts. The monitoring, evaluation and learning process, which includes inputs from partners and stakeholders, provides the feedback we need for adaptive management, i.e. reformulating our theories of change, redefining knowledge gaps and formulating new research questions.

Each SRP has a unique theory of change, as will each project. Aligning theories at each level will contribute to greater impact on a wider scale. Regional uptake strategies will be developed using a similar process.

3.1.1. Program-level theory of change

The CRP5 theory of change (Figure 3.2) is derived from the conceptual framework (Figure 2.1) and the generic theory of change (Figure 3.1). Figure 3.2 is a generalized depiction of how we foresee pathways to impact.

Figure 3.2. The theory of change for CRP5.



The process of achieving impact is nonlinear, dynamic and recursive and is driven by continuous engagement with the people, organizations and institutions that make decisions from farm to national and international scales (Douthwaite, 2002 and Douthwaite et al, 2003). We recognize that behaviors, goals and impacts are influenced by many factors outside the program and we must be aware of these. These are the drivers of change (left-hand side of Figure 3.2) which will be studied through scenario and other analyses at the global scale and at the research sites. Drivers can also be levers of change, such as policy and investments.

Development outcomes (right-hand side of Figure 3.2) are improvements in NRM resulting in changes to access, better productivity, improved soil health and water quality, better ecosystem resilience, and equity in benefit sharing – as indicated by CRP5’s objective statements (see Chapter 1). The program is *engaged* in these outcomes, but there are many other strong influencing factors. CRP5, working with others can, in certain settings, influence governance, management, policy and practices that lead to development outcomes. In addition, we generate knowledge and build capacity to facilitate change.

At the center of the Figure 3.2 is the natural resource base – the basic building blocks of soil, water and ecosystems. People change and manage these resources to produce food, fiber, fuel, medicine and cultural artifacts in a range of different agricultural systems (e.g. in irrigated or rainfed systems). Resources and farming systems are situated within basins and landscapes, and interact with multiple natural and human-engineered ecosystems. CRP5 encompasses and works within and among these various components, and will generate a range of outputs through its SRPs and several integrated outputs considering basins and landscapes, ecosystems, and means of recovering resources. CRP5 will pay particular attention to disseminating the information generated from its work to help foster change.

We recognize that this is a complex and nonlinear process with hard-to-predict feedback loops in which a change in one part of the pathway influences another part. Hence, monitoring, evaluation, feedback and learning are critical to testing the theories of change at project, regional, SRP and program levels. The Monitoring, Evaluation and Impact Assessment unit of the CRP Management Committee will develop a set of indicators during the inception phase.

As will be described later, one focus of CRP5's partnership strategy will be to engage with outreach partners, many of whom are concerned with the development and implementation of global conventions. For example, at the international level CRP5 addresses the Millennium Development Goals of reducing poverty and achieving food and water security; the United Nations (UN) conventions on desertification and land degradation (the UN Convention to Combat Desertification), biodiversity (the UN Convention on Biodiversity), climate change (the UN Framework Convention on Climate Change); and the Ramsar Convention on Wetlands; as well as the food security, environmental and development priorities of numerous intergovernmental organizations, international donors, development banks and sections of the business community.

3.2. Uptake strategies

Uptake strategies specific to each output are required to move research to outcomes. An uptake strategy combines a set of levers to affect change. There is an existing set of levers we know and employ with some success. Capacity building and policy change are two such examples. At the outset, SRP partners will decide on what combination of levers offers the best pathway to change, and then modify their theory of change on the basis of feedback in a process of adaptive management and learning selection. Some of these levers are outlined below with example uptake strategies (Table 3.1). Each SRP outlines a combination of levers specific to the problem set it addresses. As we learn, new levers and impact pathways will emerge. Monitoring, evaluation and learning have a central role to play in this adaptive learning process.

Table 3.1. Levers of change and related uptake strategies

Levers of change	Uptake strategies
Working with men and women in farming communities	Include farmers in learning alliances; learn from farmers; let farmers test, innovate, lead.
Building capacity and leadership	Design and conduct training and professional development programs that change people's knowledge, attitudes and skills and lead to new behaviors; work with schools (teachers and students) and youth groups; focus on building leadership capacity among women.
Changes in policy and incentive structures	Sit at the table with policymakers; include them in the research from the earliest appropriate stage; make them partners in changing policy and incentive structures; include women at the table.
Working with the private sector	Provide scientific support for the development of investment packages that support sustainable, pro-poor agriculture. Co-develop new and low cost technology that can benefit resource-poor land users.
Developing market chains (link with CRP2)	We have separated this from 'working with the private sector' because a number of International NGOs and civil-society organizations are equally good at this.
Consumer power	In some countries, consumers can wield significant power through their purchase decisions and through demands for accountability from government, the private sector and primary producers.
Working with strategic partners outside the water, land and environment sectors	Look outside for levers on relationships and policies such as the one between energy pricing and groundwater pumping; use one to control and influence the other.
Using new developments in social network theory to map, measure and manage partnership networks	Adjust the size and shape of networks, change the patterns of interaction within the network to stimulate new ideas and learning; recognize that women and men have separate networks and ensure that both are included.
More coordinated joint effort (interactions with donors, joint publications, conferences, capacity-building initiatives, etc.)	Set up management structures within the CRP to ensure coordinated action; manage networks more effectively.
Better use of the media, public relations and behavior change communication.	Explore innovative ways of performing research and data collection; use coordinated media campaigns for information dissemination, advocacy, focusing public opinion.
Franchising data gathering and information services.	Work with development partners on sustainable business models for gathering data on ecosystem health and providing information and advisory services.
Global fora	Position CRP5 as an agenda-setting body linked to international policy through supplying concrete examples to the global policy dialogue; publish, promote NRM; provide sound data on ecosystems problems, risks and intervention opportunities.

3.3. Moving to implementation

Outlined below is a process to ensure that the CRP5 research program is truly coherent; i.e. that the output of one project or activity is viewed as an input to another. This process is noted in the work plan under the heading *Develop regional program plans*.

1. Based on existing experience, develop initial problem sets (for regions, basins, sub-basins and ecosystems).
2. Design and implement a process of defining and prioritizing a more complete set of regional problem sets – including consultation workshops and synthesis of information.
3. For each regional problem set:
 - develop a coherent program based on the theory-of-change logic and SRP logic presented here;
 - use SRPs to integrate across regions;
 - include an exit strategy for each research site;
 - set budget goals for regional programs and projects, consider existing or ongoing projects and design new ones, and determine which budgets must be increased and which must be reduced.

We recognize also the need to move efficiently and appropriately from a focus on current research programs to future research activities corresponding to the CRP5 theory of change. As we accomplish the transition from current to future work, we will prioritize our activities in two ways:

1. During an implementation phase of approximately 6 months, we will:
 - a. Consider how to improve integration of water, soil and ecosystem work in specific environments.
 - b. Provide more detail of specific deliverables at the basin and regional level.
 - c. Consider improved ways of delivering natural resource and environmental data to users through the Information Systems SRP and the linkage with FAO and other key partners such as the International Soil Reference and Information Centre (ISRIC), with a particular emphasis on international public goods.
 - d. Develop theories of change with the key stakeholders and change agents (implementing partners) at the specified field sites to ensure ownership of program outputs and their translation into impact.
 - e. Consider beneficial interactions with CRPs 1.1, 1.2, 1.3 (on integrated agricultural systems), 3 (wheat, maize and rice), 6 (forests, trees and agroforestry) and 7 (climate change and food security), with respect to common regional approaches, field site complementarity and selection of sentinel sites.
 - f. Develop indicators required by a Performance Indicators Matrix and commence the development of detailed, rolling annual work plans that will be the basis of contracts between partners and performance monitoring.
 - g. Commission several studies of potential impact within SRPs to facilitate further prioritization.
2. We will assist the Steering Committee in developing a formal process for prioritizing new proposals. Our aim will be to commission several consultants with in-depth

experience of prioritization processes to provide options for the Steering Committee to consider for the Program as a whole. We expect the criteria used will be related to:

- a. Potential impact in terms of people and environment
- b. Our ability to capture the benefits of the R&D through effective uptake strategies
- c. Science quality
- d. Capacity of partners to deliver.

These two strategies will enable us to maintain focus, while terminating non-performing or completed projects. In addition, we will have the flexibility to consider new research activities motivated by changes in the external drivers affecting agriculture, natural resources and environmental management. An annual Workplan for CRP5 is presented in Appendix 4.

The Program Steering Committee (see Chapter 13) will lead the process of ongoing prioritization of activities within the SRPs and will set strategic directions.

4. Strategic Research Portfolio: Irrigated Systems

Our vision: a revitalized Asia, a vibrant Africa, and a food-secure world

We envision a world in which public irrigation systems in Asia return to their productive potential while adapting to climate change and to increasing demands on water. A world in which men and women farmers in Africa are finally able to take full advantage of their abundant water resources. A world in which irrigation lifts millions more farm families out of poverty, while helping them adapt to the vagaries of climate and ensuring their, and our, food and nutritional security. We envision a world in which the remarkable social and productive benefits of irrigation are not offset by harmful impacts on the environment, but rather are enhanced by investments and policies that promote sustainable practices and protect supporting ecosystem services.

4.1. The compelling need for this research

The need to increase global food production at reasonable cost was clear long before the most recent food crisis. Irrigation has long been the cornerstone of global food production, owing to its direct and indirect impacts on crop yields. Irrigation gives farmers the assurance they need to plant new varieties and invest in their soils. Investments in large- and small-scale irrigation represent one of the most effective poverty reduction strategies of the 20th century, and still offer great potential across large areas of Asia and Africa. Irrigation, and the water storage systems that support it, have stabilized village, regional and national economies against rainfall variability, thus enhancing capital accumulation and economic growth. This aspect of irrigation's value to society will become even larger as households and countries across the globe adapt to the increasing variability in water supplies that will come with not only climate change but also with increasing competition from other water users.

Given irrigation's past contributions and the outlook for even greater value, one might expect irrigation systems to be among the world's prized and highly managed capital assets. Yet many irrigation systems are under financial and political pressure, with invidious political economies trapping many public systems in build–neglect–repair cycles even as demands on those systems and competition from other water users increases. Groundwater overdraft is increasingly dire in some regions, threatening the livelihoods of millions of smallholder households. Some of our most productive irrigated areas now suffer from salinization and waterlogging due to poor planning, inadequate investments and our failure to address important externalities (unintended costs or benefits that result from industrial or commercial activity, and which are not reflected in the cost of the goods or services involved). We have known of these problems now for decades, yet our scientific understanding has not translated into the right policy choices. We must continue exploring scientific frontiers while extending our knowledge more effectively into the policy realm.

To achieve our vision of a revitalized Asia, a vibrant Africa and a food-secure world within 10 years, we must conduct the research needed to answer several pressing questions regarding the