Catalysing adaptive capacity for development and climate change: An exploration of social learning and social differentiation in the CGIAR

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CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)

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Abstract

There is convergence between current theory and practice in global environmental change research and development communities on the importance of approaches that aim to 'engage and embed', i.e. engage diverse and relevant actors in knowledge creation and embed scientific information into societal contexts. Social learning has emerged as a way to both approach and characterise innovative ways of doing this. Defined here as "a change in understanding that goes beyond the individual to become situated within wider social units or communities of practice through social interactions between actors within social networks" (Reed et al. 2010), a social learning approach situates scientific research as just one form of specialised knowledge amidst other contextual knowledge.

Co-learning – by bringing diverse knowledge and social worlds together to exchange needs, values and norms – is considered necessary for addressing complex, wicked problems and for building decision processes and adaptive structures that help navigate uncertain futures. Including socially differentiated groups into processes of knowledge creation and decision-making may fundamentally alter what questions are asked, how changes in practices are framed and how to break down systemic patterns of vulnerability and marginalisation. This paper investigates the synergies (and trade-offs) associated with integrating socially differentiated stakeholders and/or groups – the poor, women, elderly, youth and indigenous – into social learning processes aimed at addressing poverty reduction, livelihood development and longer term resilience.

An exploratory scan of CGIAR identifies projects that engage socially differentiated groups in processes of social learning. Cases were characterised for their treatment of i) the particular context, including rationale for the engagement of socially differentiated groups, ii) the design of engagement interfaces, iii) the type of learning loops occurring, iv) particular channels that contributed to learning across networks and, where applicable, v) the outcomes and lessons from the learning process. The findings suggest that diverse forms of social differentiation and learning are occurring across many of CGIAR's fifteen research centres. This is in part due to institutional reform that has put an increasing emphasis on gender strategies and monitored development outcomes. A more explicit recognition of the role and 'added value' that social learning research approaches have can enhance its visibility and ultimately the effectiveness of CGIAR's vast research partnerships.

Keywords

Social learning; social differentiation; adaptive capacity; livelihoods; climate change

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Contents

Introduction

Empirical evidence from both theory and practice point to the need for scientific research to be socially embedded in particular socio-ecological contexts, linking decision-making with appropriate bio-geographical scales (Cash and Moser 2002) and scientific research with practice (Vogel et al. 2007). The emphasis on developing knowledge for real world change reflects the recognition that: 1) there is a critical and urgent need to fill the knowledge-action gap by applying relevant knowledge to complex issues such as poverty reduction, food security and climate change (Kristjanson et al. 2009; Vogel et al. 2007); and 2) relevant and legitimate knowledge and strategies for action must integrate the knowledge and networks of relevant stakeholders. This requires exchange and learning among diverse actors in both knowledge production and decision-making. Integrating the needs, values, norms and knowledge from smallholder farmers to non-governmental organisations to extension agents and decision-makers into the research and decision-making process has the potential to guide communities and, in the case here, social groups in responding to complex challenges.

Evidence suggests that integrating multiple stakeholders in knowledge generation and decision support allows for boundary spanning that enhances relevance and legitimacy, while maintaining credibility of science (Clark et al. 2011). In agricultural development and in climate change adaptation planning, the goal is to foster socially appropriate strategies that lead to changed behaviour in practice. Emerging global and local challenges require innovative and experimental ways of linking science and policy (Jasanoff and Wynne 1998; Cash et al. 2006; Clark et al. 2011). Social learning among and between diverse relevant stakeholders at diverse scales of practice and policy action has been proposed as a way to experiment with adaptive and iterative paths forward under complex and uncertain conditions (Fazey et al. 2007; Armitage et al. 2011; Reed et al. 2010; Rodela et al. 2011; Yuen et al. 2013; Bos et al. 2013; Harvey et al. 2012).

The concept of social learning is emerging in diverse areas of scholarship ranging from development research and practice to global environmental change to socio-technical transitions, governance and sustainability theory (Armitage et al. 2011; Bos et al. 2013). It is seen as both a research approach and a governance mechanism to optimize learning in knowledge production and decision-making for "wicked" problems, such as climate change. The literature emphasizes social learning as an ongoing social process focused on dialogue and exchange that incorporates knowledge from various perspectives and different social levels, which may influence questions asked and policies formed that may otherwise not have occurred (Nilsson and Swartling 2009).

Social learning is an inclusive and iterative approach for navigating multi-scale, cross-cutting issues. This type of learning moves beyond the individual to extend across broader social groups and networks, with the potential of leading to greater impacts for transitioning toward more sustainable practice. For the purposes here, it is defined as "a change in understanding that goes beyond the individual to become situated within wider social units or communities of practice through social interactions between actors within social networks" (Reed et al. 2010). The understanding is that including diverse relevant and contextual knowledge will lead to exchange and learning that helps to shape relevant problem definition, process design and inputs into strategies for change, thereby empowering actors to shape policies and programmes that affect them while also increasing the relevance, legitimacy and mobility of

knowledge and strategic outcomes to inform action for sustainable development (Fazey et al. 2007; Vogel et al. 2007; Bos et al. 2013).

Recognizing and dealing with the plurality of stakeholders' perceptions, values and goals is critical for learning in end-to-end integrated systems that connect scientific projections and observations to decision-relevant impacts and options for moving forward within complex systems (Kristjanson et al. 2009). It is clear, however, that undertaking such an approach generates procedural complexity, or 'messiness', in research design and process that is likely to require additional resources of time and financing. This complexity makes it necessary to move from a 'knowing' frame to a 'learning' one; diverse stakeholders provide the diversity of knowledge that forms a piece of the puzzle for how to move forward. This type of approach is experimental (Kristjanson et al. 2009; Bos et al. 2013). Social learning is a continuous process that aims to learn from and mobilize both successful adaptations and outcomes and failures. As such it requires new ways of considering program budgets and indicators of success and, overall, ways of incentivizing social learning approaches within organisations and among funding agencies and organisations (Kristjanson et al. 2009). Jones et al. (2010) note the need to "move beyond asset and capital impact indicators to ones measuring more intangible processes, including networks, decision-making and governance, innovation and experimentation, and institutional capacities for forward-looking features that contribute to a dynamic not static form of adaptive capacity of a system" (p. 2).

Conceptual clarity is emerging about what social learning is, how it differs from other approaches and when it is most appropriate for linking knowledge with action (Reed et al. 2010). This clarity is contributing to efforts to better understand and evaluate when the approach is most useful, and in what ways the benefits outweigh costs and trade-offs (Harvey et al. 2012). Current inquiry examines how learning occurs or can occur, the extent to which social learning is facilitated by participatory processes, how best to design processes to facilitate learning experiments and the ways that learning may (or may not) lead to positive socio-ecological outcomes (Reed et al. 2010; Rodela 2011; Bos et al. 2013).[1] As an analytic tool, identifying optimal conditions for social learning will help to highlight strengths and weaknesses of this type of approach in tackling complex issues both in processes of knowledge production and governance (Nilsson and Swartling 2009).

The roots of social learning converge from multiple disciplines, methods and approaches including a long history of solutions and results-oriented science. In development and livelihood research and practice, for instance, a suite of participatory action research approaches have been used that exemplify "voices from the community" with the aim of linking knowledge with action (Brydon-Miller et al. 2003; Vogel et al. 2007). These tools have been critical for bridging local and global knowledge and decision requirements among a myriad of strategic actors, for instance in community-based natural resource management, ranging from improvement of management of lands and ecosystem services to pest resistance and market success. Inclusive and dialogic approaches and tools such as participatory mapping and scenario planning, multi-stakeholder processes, online crowdsourcing,

[1] For instance, Reed et al. caution that social learning should not be confused or conflated with: 1) stakeholder participation – learning does not always occur with engagement; 2) improved outcomes, particularly pro-environmental behavior – learning may occur that does not align with pro-environmental behavior and alternative processes (e.g. regulation) may lead to same outcomes without learning; and that 3) learning that only occurs in individuals (Reed et al. 2010).

participatory varietal selection and others have contributed to results-oriented research. In this way, learning approaches can already draw from a rich methodological history of engaged and dialogic approaches aimed at improving current and/or future conditions. Similarly, literature from climate change vulnerability assessment and adaptation planning arrives at the need to promote shared learning among multiple stakeholders in order to move forward on socially appropriate strategies that build capacity among the most vulnerable and contribute to overall goals of sustainability (Kates et al. 2001; Adger et al. 2005). A social learning approach adds value to these efforts to link knowledge with action by applying an inclusive and iterative learning orientation, creating continuity and flexibility among participants and partner organizations, allowing for and sharing experimentation at an integrated systems level and nurturing supportive networks for action (Kristjanson et al. 2009; Yuen et al. 2013; Bos et al. 2013).

Vulnerable groups and social learning

An additional way for a social learning approach to add value, particularly in realms of poverty reduction, food security and adaptation to climate change, may be to apply a learning orientation to vulnerable communities and socially differentiated groups. Learning about current needs and projected impacts is necessary in order to devise relevant adaptive strategies. This, therefore, becomes a particularly important undertaking among the vulnerable (Smit and Wandel 2006).

Emphasizing social learning among the vulnerable and among socially differentiated groups may be of benefit for identifying particular vulnerabilities and strategic intervention points. It may also contribute to framing co-benefits of actions between poverty reduction, livelihood development and enhanced adaptive capacity to climate change that get shared and mobilized across relevant networks (UNDP 2010; Kakota et al. 2011). Of interest for this working paper is: 1) whether and how exchange among researchers and socially differentiated groups, or targeted engagement of the most vulnerable, contribute to learning and to the production of more relevant and legitimate knowledge; 2) how knowledge is mobilized across networks of socially differentiated groups; and 3) where possible, how these factors advance development outcomes. In other words, what are the benefits and trade-offs of including socially differentiated groups in social learning approaches with the aim of increasing overall impact for sustainable development outcomes?

Real and projected impacts of climate change are differentiated across populations, communities and social groups across the globe. We know, for example, that climate change impacts will not be homogeneous among sectors, populations, communities and households for two reasons. First, global circulation models project differences in the magnitude and direction of climate change. Second, even within a region experiencing the same characteristics of climate change, the impacts are likely to vary because some ecosystems, sectors, or social groups are more vulnerable to change – climate and otherwise – than others (O'Brien and Leichenko 2000).

Those already vulnerable to natural hazard and socioeconomic risk and climate variability, such as resource-poor farming households, have limited capacity to respond to both short and long term change either related to economic and market stressors, seasonal climate variability and/or long-term climate change (Chakraborty and Newton 2011; Agrawal and Perrin 2009; Abraham and Purkayastha 2012; Kristjanson et al. 2012). A major lesson from vulnerability

research is that climate change is one of many relevant factors in the analysis and that adaptation depends on complex relationships between processes in many social, economic, technological, ecological and cultural subsystems (Brooks 2003; Füssel and Klein 2006; Thomalla et al. 2006).

Vulnerability to climate change is shaped by exposure and sensitivity to change in social and ecological systems. It can be defined as "the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change... vulnerability is a function of the character, magnitude and rate of climate change and variation to which the system is exposed, its sensitivity, and its adaptive capacity" (IPCC 2007). Decreasing vulnerability involves adaptation, a process of coping with or managing changing conditions, hazards, risks or opportunities (Smit and Wandel 2006). Adaptation is the "adjustment in natural or human systems in response to actual or expected climatic stimuli or other effects, which moderates harm or exploits beneficial opportunities" (IPCC 2007, p. 869). How and whether adaptation occurs, and how well socio-ecological systems are able to cope, will be dependent on the internal adaptive capacity of the system(s). In vulnerable socio-ecological systems, building internal adaptive capacity is required to ensure internal functioning (and continuous coping) over short- and long-term variability and uncertainty. Systems with high adaptive capacity are able to rapidly respond, internally reconfigure and seize emerging opportunities for adjustment and change without significant decline.

As such, the need for approaches that identify and respond to vulnerability and contextual challenges within complex systems becomes an important undertaking. It is important to note that spatial scales may determine vulnerability whereby countries with low vulnerability to climate change may have certain subsets of the population or particular groups that are vulnerable (O'Brien et al. 2004). This raises attention to ways research projects and governance structures could become more adaptable to cross-scale vulnerabilities.

Climate variability and change is already influencing the effectiveness of development and livelihood outcomes in areas such as resource management, community development and planning, risk management, food security, livelihood security, and sustainable development (Smit and Wandel 2006; Pringle and Conway 2012). A livelihood is sustainable when it can cope with and recover from stresses and shocks and maintain its capabilities and assets both now and into the future, while not undermining the natural resource base (FAO). While approaches and projects in development and livelihood fields may not explicitly refer to adaptation or adaptive capacity, the leverage points for changing practices and behaviours that increase adaptive capacity both over the short and long term are likely to be similar (Smit and Wandel 2006). The need for adaptation to climate variability and change is increasingly emphasized in exposed, complex and dynamic systems such as livelihood development, and areas such as resource management, community development and planning, risk management, food security, livelihood security, and sustainable development (Smit and Wandel 2006). As such, the UNDP (2010) states that "harmonizing human development and efforts to manage climate change, [makes] it possible to accelerate socio-economic progress" (p. i).

It is clear that existing complex socioeconomic and livelihood vulnerabilities tend to be exacerbated by climate change. For example, closely connected human-environment systems such as agricultural systems are highly exposed to variability in climate as well in economic systems (for example commodity markets, trade relations, and so on), making the sector

sensitive, and thus vulnerable to change (O'Brien and Leichenko 2000). In the developing world, in particular, agriculturally-related communities straddle three distinct vulnerabilities: 1) economic vulnerability – the twin pressures of climate change and processes of economic globalization create a 'double exposure' of variability in market conditions that link production, labour and land-use patterns and climate variability (O'Brien and Leichenko 2000); 2) social vulnerability or the degree to which societies or socially differentiated groups are affected by both internal and external stresses and hazards that negatively impact social cohesion (UNDP 2010); and 3) hunger vulnerability – for the world's poor, socioeconomic dependence on agricultural outputs and exposure to climate variability leads to spiralling vulnerability, exacerbating poverty and food insecurity.

These complex livelihood-vulnerability contexts make novel areas for learning experiments (Tschakert and Dietrich 2010). For instance, socially differentiated groups such as the poor, certain ethnic groups, women, youth and the elderly tend to be the most vulnerable to environmental risks, natural hazards and variability (Abraham and Purkayastha 2012). Just as the impacts of climate change are and will continue to be differentiated across diverse sectors and among different nations and communities, a more nuanced view of the heterogeneity in vulnerable communities may be required (Adger 2003, 2005; Smit and Wandel 2006). Access to knowledge and power among members of communities tends to be socially differentiated along lines of gender, age, class, education, and, in many cases, ethnicity (Cutter and Finch 2008; Espinosa 2004; Agrawal et al. 2009). In community-based natural resource management, including and responding to social differentiation has emerged as a considerable determinant of effectiveness in project design (Deverill et al. 2001; Espinosa 2004). It is also the case that socially differentiated characteristics play a considerable role in determining vulnerability, including the ability to respond to risk. Some social groups are unable to access the knowledge, technology and decision-makers that may help to reduce their vulnerability (Kelly and Adger 2001; Kakota et al. 2011).

Managing asymmetries of power in processes of social learning also presents a critical opportunity for improving outcomes in livelihood development and the adaptive capacity of the most vulnerable to climate change (UNDP 2010; Kakota et al. 2011; Paris 2006; Lundy and Gottret 2006). For instance, climate impacts on crop production are expected to decline 20-50% under climate change (UNDP 2010). Rural women are responsible for half of the world's food production and produce between 60-80% of the food in most developing countries. Yet women have limited access to resources, restricted rights, limited mobility and reduced authority in the community and, often, in the households which are likely to be exacerbated under climate change (Paris 2006; Kakota et al. 2011; Brody et al. 2008). Existing asymmetries of power and access to knowledge and technology can therefore lead to exclusion and/or disadvantages in development outcomes if not given appropriate consideration. A more optimistic expression is emerging from inclusive, targeted gender strategies and programs (UNDP 2010; Kakota et al. 2011), emphasizing gender transformative approaches (CGIAR AAS 2011) and transformative change for rural women's empowerment (Okali 2011). Findings indicate that beyond empowering and building capacity among women, including women can lead to enhanced and accelerated development outcomes (Kakota et al. 2011).

A framework for examining social learning and social differentiation

This working paper focuses on the role of social differentiation and social learning in climate change, agriculture and food security research in the CGIAR. Projects and programs were identified that have targeted socially differentiated groups to promote learning and change in agriculture-related sectors (emphasizing vulnerability, access to information, and perceptions of risks and climate impacts). For these case studies, what information is being used, how exchange is being designed with socially differentiated groups, and its effectiveness in changing real-world practices, is explored. Social learning has a number of different definitions and approaches (Reed et al. 2010; Rodela 2012; Harvey et al. 2012), including different units of analysis, ranging from the individual to broader networks within society (Rodela 2012).[2] For the purposes here, however, social learning is defined as "a change in understanding that goes beyond the individual to become situated within wider social units or communities of practice through social interactions between actors within social networks" (Reed et al. 2010). Reed et al. (2010) caution that participation and interaction alone will not "necessarily lead to a deeper understanding of the context, power dynamics, and values that influence the ability of people and organisations to manage natural resources effectively". What research, knowledge and policies are adopted as relevant and appropriate is negotiated by stakeholders with different contextual needs, values and norms, often leading to adoption if they are the beneficiary or rejection if they do not see the value (Salter 1988; Jasanoff and Wynne 1998; Gieryn 1983; Guston 2001). This negotiation occurs whether it is managed or not. A case can be made that proactively designing and managing these areas where science interfaces with society can ensure greater learning, value and overall usability of science for diverse contexts. Bos et al. (2013) argue for the strategic creation, design and evaluation of social learning situations. Learning situations that are designed and operationalized where actors exchange information, values and shared meaning through interaction, build relational capacities and networks, and also build the basis for joint future action may contribute to more broad-based adoption of strategies and policies (Pahl-Wostl et al. 2007).

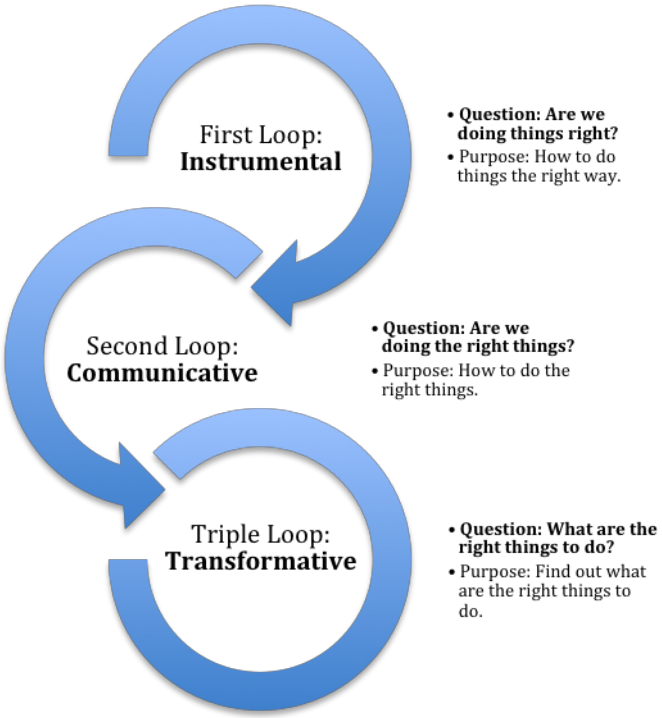
Social learning is a dynamic and iterative process. Triple-loop learning is a way of characterizing a range of learning that can occur (Figure 2). All three loops contribute to substantive learning. However the problem to be addressed and resulting questions asked may determine the extent and depth to which social learning occurs (Fazey et al. 2007). For instance, single-loop learning aims to address technical problems, such as ways to increase efficiency within an existing framework of values, norms and assumptions. This type of learning leads to changes in cognitive understanding among different participants. Once the framework of values, norms and assumptions is brought into question and problematized, however, double- and triple-loop learning may be occurring.

Double-loop learning shifts participants' mindsets or frames-of-reference which changes future practices among interdependent actors. Triple-loop learning brings more fundamental assumptions and protocols of governance into the purview of learning. This is thought to foster change in institutional contexts and governing conditions (Yuen et al. 2013; Bos et al. 2013). Learning is not linear, but is iterative and builds momentum over time. Learning may

2 Rodela (2012) examines the different uses of social learning in the literature. She identifies three units of analysis: 1) the individual, 2) the individual linked to the network or social group, and 3) the individual within social-ecological systems.

shift fluidly between one loop and another, even within one project duration. They are not sequential or hierarchical but lead to different forms of learning and emergent learning outcomes (see Figure 1).

Figure 1: Triple loops of social learning have questions and purpose related to: 1) instrumental, (i.e. acquiring new knowledge or skills), 2) communicative (i.e., understanding and reinterpreting knowledge through communication with others) and 3) transformative learning (i.e. whereby exchanging information and examining underlying assumptions leads to change in attitudes, behaviours, and institutional, governance and/or social norms) (adapted from Fazey 2010 and from Yuen et al. 2013).



Triple-loop learning emphasises learning as a way to build relevant knowledge and appropriate outcomes as a way forward in complex dynamic systems. It also emphasizes development questions, design and process in a continuous and iterative way.

For the purposes here, an exploratory scan of the CGIAR aims to identify projects that emphasize exchange and social learning among socially differentiated groups. Outlined below are five high-level, yet critical features viewed as necessary for enabling a social learning situation among social differentiated communities and groups. These are not exhaustive features but are viewed by the author as key factors for consideration in guiding selection and evaluation of cases in this review.

1. **Context**: particular consideration is given to existing power dynamics in local, socio-ecological systems and to identifying and including vulnerable, socially differentiated groups in learning processes in order to exchange relevant information and overcome asymmetries in both access to and contributions to knowledge (Brydon-Miller et al. 2003; Asdal and Moser 2012).
2. **Knowledge producer-user interface**: exchange of knowledge, perspectives, needs, values and norms occurs once science interfaces with society in a particular context. Unmanaged, the negotiation of scientific relevance and legitimacy for context occurs at this interface. This can lead to rejection of science, the reinterpretation of science in

context and/or a change in understanding and practice. Deliberately designed interfaces are better able to co-create relevance and legitimacy of scientific information and extend from transmission of relevant information, from engagement to hybrid or co-creation interfaces (Jasanoff and Wynne 1998; Cash and Moser 2000; Shaw 2005; Guston 2001). 'Safe spaces' for multivaried and/or peer exchange and learning are viewed as innovation hubs where diversity and creativity is unleashed (Kristjanson et al. 2009; Dale and Newman 2006).

3. **Types of learning**: the type of learning (Figure 1) occurring – instrumental (one loop), communicative (double-loop) and/or transformative learning (triple-loop) (Fazey 2010) – will determine the extent to which transformative change happens (see Figure 2). Triple-loop learning is dynamic and helps to characterise both approach and learning outcomes (Yuen et al. 2013).

Social learning involves designing optimal approaches for exchange among specific groups and/or multiple stakeholders to contribute to learning that otherwise would not have occurred and appropriate channels to mobilize that learning.

1. Channels through which learning occurs: approaches, tools and networks used to link and engage people in the learning process and mobilize learning beyond the individual are key (Reed et al. 2010; Rodela 2010).
2. Outcomes: if and how learning translates into changes in practice, and ways new network formations decrease vulnerability in the short term and increase adaptive capacity over the longer term (Reed et al. 2010).[3]

The assumption is that a combination of these characteristics will increase relevance, bi-directional exchange and overall learning and also the design of socially robust interventions, considered to be more likely for increasing impact (Carvalho 2010).[4] In particular, a contextual understanding about who is and is not included in order to overcome disparities in power relations and to encourage learning about needs, values and norms among socially differentiated groups is key (Adger 2009).

Methods for investigating the CGIAR

The Consultative Group on International Agricultural Research (CGIAR) has a considerable history of working with diverse regions, groups and communities in order to increase the relevance and impact of its agricultural research knowledge and products. Over the past 40 years, CGIAR has united researchers for sustainable development and investors in research with similar goals – helping to reduce poverty and hunger, improve human health and nutrition, and enhance ecosystem resilience through high-quality international public goods in agricultural research, partnership, and leadership. Given its mandate, history and expertise, the CGIAR becomes a considerable learning laboratory from which to examine which types

3 It is expected that the outcomes from a social learning process will grow over time. Models for recording and reporting actions related to social learning are being developed, however it is difficult to attribute specific behavioural outcomes to learning processes. However, when dealing with social learning beyond the individual, changes in practices among researchers and multistakeholder groups or socially differentiated groups are more easily identifiable. Monitoring learning in long-term partnerships over time may be a way of identifying outcomes and determining impact.

4 Reed et al. (2010) caution against conflating social learning with pro-environmental outcomes. While the goal here is to encourage learning and pro-poor, pro-environmental outcomes, there is a recognition that participatory process and social learning may not necessarily result in pro-environmental outcomes.

of knowledge, knowledge production processes and approaches have been effective (or ineffective) in increasing adoption of science and technology in practice. Numerous social learning approaches have been designed and experimented with across the CGIAR, ranging from participatory mapping, participatory varietal selection, long-term engagement with key stakeholders through learning alliances, to name a few (see Gonsalves 2013).

There are two particular ways that CGIAR provides an opportune learning laboratory from which to investigate the role that social learning and social differentiation may play in increasing agricultural research and development impacts and outcomes. First, the new CGIAR Strategic Framework requires that research be relevant and applied and will involve experimentation about ways to monitor outcomes. Second, gender is a cross-cutting theme of high priority in the CGIAR. Gender specialists, and perhaps more transformatively, gender-focused research teams are being hired and/or empowered by the research centres. The Global Rice Science Partnership (GRISP), involving IRRI and partnering organisations, for example, gives attention to how gender will be tackled in all its research activities. Diverse tools, approaches and strategies for including and accounting for women and other disadvantaged groups, such as the rural poor, in agriculture are being developed and employed in new projects, often with multiscale partners (for example farmers' associations, governments, and non-governmental groups such as CARE International, PROLINNOVA, the Sustainable Food Lab, and so on).

In 2009, CGIAR shifted its approach, adopting a more programmatic Strategy and Results Framework, to coordinate the 15 Centres, strengthening collaboration for streamlined results-oriented research. A portfolio of 15 cross-centre, problem-focused CGIAR Research Programs has been developed, providing CGIAR scientists and partners with new means to deliver international public goods that address major global issues in development and development impact. The Climate Change, Agriculture and Food Security (CCAFS) research program was one of the first thematic collaborative research programs (CRP), which builds upon the antecedent 2009 ‘Challenge Program’, and involves all 15 CGIAR centres.

Given the emphasis on linking current and projected climate impacts and responses to agricultural and livelihood research and development, CCAFS provides an opportune space from which to consider and to experiment with new types and forms of research and learning. In addition, the emphasis on increasing livelihoods of the poor, food security and adaptive capacity provides the (rather daunting) space to focus on asymmetries in power affecting social differentiated groups (for example women, elderly, youth, poor, indigenous). This context appears to be particularly conducive for considering innovative forms of research and practice, linking knowledge with action.

An exploratory scan of socially differentiated projects in the CGIAR

An exploratory scan was undertaken across the 15 CGIAR centres to identify areas related to social differentiation and social learning. Code words were used to search for socially differentiated groups. These were “gender” (“women”), “age” (“youth” and “elderly”), “ethnicity” (including “indigenous”) and socioeconomic status (“rural poor”). Once projects and activities identifying socially differentiated groups were identified, searches were conducted using code words for social learning assigned to each of the three learning loops. The CCAFS 2011 Annual Activity Plans for all 15 research units and the CGIAR website

(http://www.cgiar.org/) were mined for reflective blog posts and different code words to identify learning loops.

Once projects emphasising socially differentiated groups were identified, they were re-categorized based on code words (see Box 1). This coding process helped to initially categorize the social learning loop in the project. CGIAR projects were broken into four categories:

1. Social differentiation and social learning in CGIAR (8 projects)
2. Social learning innovation in CGIAR (9 projects)
3. Centres and contacts for social learning (6 projects)
4. Relevant CGIAR partner organisations emphasizing social differentiation (3 projects)

Due to limited time, this coding process emphasized projects identified as *transformative*, or third-loop, learning and *communicative*, or second-loop, learning (see Appendix 1). In order to explore the types, processes and content of social learning, and project treatment of context, asymmetry in power, interviews were conducted with project leaders and managers.

Box 1: Code words for learning

Instrumental: *informing context and practice* - "recommendations", "tool box"; "inform", "decision support", "targeted information"

Communicative: *engaging participants post-facto* - "engagement", "participation", "identify and/or prioritize options", "capacity-building"

Transformative: *including participants pre-facto in the co-design of relevant research*; "co-frame", "co-create", "partnerships"; "collaboration"

Of the 26 projects identified, 28 people were contacted for interviews, of which 15 responded, and only 9 were able to schedule an interview within the allotted time. Two of these interviews were held with organizations with previous or ongoing partnerships with CGIAR research centres. Interviews were semi-structured by design. Nine interviews were conducted and recorded over Skype with available researchers.

Results and discussion

An analytical table was created and used to distil key process and content learning from each of the projects investigated. Appendix 3 provides details from the web, documents and interviews in nine case studies. This data informs the following discussion.

The case studies suggest that the integration of socially differentiated groups, including women, indigenous and the rural poor, and other relevant stakeholders into research design is contributing to contextual exchanges about needs, values and norms among the most vulnerable. While most use methods that are not referred to as social learning per se, this exploratory scan and evaluation identifies numerous initiatives where single- and double-loop learning (e.g. crop management techniques, participatory action research, participatory varietal selection) is happening. Of particular interest are indications of triple-loop learning starting to occur. What is clear is that integration of socially differentiated groups into research on livelihood development and adaptive capacity is creating technical and cultural learning in both directions, between researchers and users. Below, the context for including socially differentiated groups, the type of interface developed, the extent of the learning, the channels used to mobilize new knowledge and the outcomes or impact of the research are discussed. This section provides a high-level discussion of the findings.

The role of context in identifying socially differentiated groups

Learning approaches are being undertaken in communities, ranging from the lowlands of Bangladesh to the watersheds of Kenya to the alpine terrain of Peru. In most cases, communities were particularly vulnerable to natural hazards such as flood risk, drought, water scarcity, climate variability and/or crop failure. In smallholder or family agriculture, development NGOs have developed gender strategies outlining the ways that both men and women have allocated duties related to yielding crops for market and for food supply. Yet traditionally, resources, including intellectual resources, are directed at men and/or landowners. For example, IRRI, AfricaRice, Worldfish, CIAT and CIMMYT have begun to differentiate along gender lines in double-loop learning approaches such as participatory varietal selection. The goal of WorldFish, in particular, is to increase both women and men farmers' and fisherfolks' livelihoods and adaptive capacity through 'transformative gender research approaches' (AAS 2012; Kakota et al. 2011). Overall this targeted approach is an attempt to better understand gender roles and duties and, as such, the differentiated needs and asymmetries of power, particularly as they relate to resource allocation.

In CIP, indigenous knowledge is integrated to support biodiversity mapping in the Andean alpine areas of Peru. This is an attempt to use indigenous knowledge to better understand the current impacts of climate change and its effect on potato crops at altitude.

Similarly, CIAT's integration of smallholder farmers in supply chain-oriented 'Learning Alliances' began as an attempt to better understand the realities of and opportunities for smallholder production in global markets and to link local producers with global commodities organisations. Learning Alliances are gaining purchase among global corporations such as Sysco, bringing critical players into codevelopment of strategies and approaches with farmers and others that create a more sustainable food supply chain from production to sale.

Interfaces and approaches that contribute to inclusive exchange

Many of the CGIAR interviewees described the ways in which strategically designed interfaces that include socially differentiated groups provide 'safe spaces' for knowledge exchange. These exchanges create informal learning networks that build trust and awareness while simultaneously creating environments for the strategic co-creation of relevant questions to be asked and solutions sought. An example of this is IRRI's participatory varietal selection approach targeting women in India. In order to elicit input from women, a segregation of men and women and upper and lower castes of women was necessary, thus creating 'safe spaces' for ideas to be shared and exchanged.

In contrast, boundary-spanning interfaces were formed in CIAT's 'Learning Alliance' project. These interfaces occurred through workshops and via internet communications and involved researchers, small-scale farmers, global food supply companies, and non-governmental organisations. Exchanges at these interfaces lead to a better understanding of strategic points of intervention within the whole system, while also leveraging decentralized networks. CIAT researchers reported that linking the rural poor into the supply chain network was difficult. It required considerable trust-building exercises among farmers to encourage knowledge-sharing and to initiate processes of linking to larger, more stable markets.

A critical aspect of exchange is that it can expose different and conflicting worldviews. This can be important for developing alignment on strategies for moving forward that meet local needs and build legitimacy in the process. In the case of the World Wildlife Fund (WWF) and CARE-Kenya's 'payments for ecosystem services' (PES) project in Kenya's Upper Naivasha Catchment, exchange between researchers, practitioners, vulnerable catchment residents and relevant organizational and governmental actors generated awareness around the need to dovetail efforts to prevent ecosystem degradation and cycles of poverty. Using 'bottom-up' learning approaches and a gender-sensitive financial mechanism that ensured money received was used for on-farm advances led to upper-catchment residents getting paid to be responsible for improved agricultural and ranching practices, agroforestry and protection of the existing ecosystem. Learning about ways to provide measures of poverty reduction, livelihood development and ecosystem protection linked critical actors such as residents, water users, forest services staff, provincial administration and the Ministry of Agriculture. The links between researchers and knowledge generation and systems of governance or power structures provided relevance and legitimacy in the process while also reinforcing community commitment. A number of case projects identified how peer processes provide collectivity and validate perceptions of changing conditions. In two cases, it was noted that peer exchange made the perceived need for change more clear.

Identifying the different loops of social learning

Bi-directional learning is also occurring across these interfaces. This learning has led to better understanding of local contexts, including the role that socially differentiated groups can play in agricultural research. Examples of each level of triple-loop learning were found across the case studies. These are presented with the recognition that these examples provide mere snapshots of social learning and social differentiation projects and that, in practice, learning is fluid, occurring iteratively over time.

Examples of single-loop learning are seen in numerous projects focusing on capacity strengthening. Many of these focus on training individual farmers in the skills needed to change behaviour regarding specific agricultural practices – for example, in planting and caring for crops appropriate for changing climatic conditions.

Double-loop learning is seen in project approaches that focus on differentiated preferences associated with gender. Including women in participatory varietal selection (PVS) for instance, by projects led by IRRI, CIAT and AfricaRice increased the visibility of their role (and to a lesser extent, youth) in family agriculture. This led to substantive learning about different varietal preferences among men and women, related to different on-farm and off-farm roles and needs. Varieties have been created to address women's needs for quick cooking rice and bean varieties, using less wood and reducing the amount of time women devote to cooking. In addition, through the PVS approach, women have been able to express additional preferences and/or innovations such as growing (better) fodder for animals, which increases milk production and overall health of livestock. Communication of preferences extended to technical innovations, such as increasing the size of the pots used for washing rice after harvesting.

For triple-loop learning to occur, the learning from the work with socially differentiated groups in the field has to link back to researchers, who are then able to re-evaluate their own questions and practices. The case studies suggest that inclusion of socially differentiated groups has helped researchers understand that to have impacts on livelihoods, food security and adaptive capacity, there is a need to incorporate different needs and values right from the 'problem formulation' stage of research. In three cases, IRRI, CIAT, and Worldfish, they found that incorporating varietal characteristics to match women's preferences enhanced overall efforts on the farm (e.g. switching to low growing varieties that are easier to thresh) and in the household (e.g. adopting fast cooking varieties that save time and fuel). As one CIAT researcher notes, "Researchers should be part of local knowledge exchange. They should see how [other knowledge] fits into research".

Another project demonstrating triple-loop learning is the CIP case study. Beginning as a participatory mapping exercise that included indigenous farmers to better understand and map potato diversity at elevation in the Andes, it quickly evolved into something more. During the mapping exercise, researchers learned about numerous varieties previously unknown to science. They also learned that traditional knowledge ensured that a diversity of varieties was planted as a food security strategy to cope with high climate variability. In addition, researchers learned that women and the elderly tended to have much better knowledge of traditional varieties and their use than the owners of the land. The 'triple loop' was achieved when the researchers used these lessons to totally redefine their research questions and approaches to better assist the communities' food security strategies and enhance their adaptive capacity to a variable and changing climate.

Channels for social learning among socially differentiated groups

In many of the cases, learning that led to relevant interventions among socially differentiated groups was then mobilized across networks, motivating even greater impact. Cited benefits of including socially differentiated groups related to the potential for accelerated learning. For example, farmer-to-farmer learning videos were tested by AfricaRice in comparison to innovation/training and visit systems. They found an over 80% greater adoption rate of new

technologies and practices with the farmer-to-farmer learning video approach. This became an "appropriate learning tool" for farmers in general. There was also anecdotal evidence that women who watched the videos changed their practices while also being empowered to creatively adapt technologies to their own environment, an innovative outcome. Extensionists were utilized to deliver the videos and to record associated responses and changes in practice. The result of this tool is that farmer-to-farmer videos gets mobilized quickly and, delivered through legitimate agents, contributes to increased outcomes among the rural poor at very low cost.

CIAT's Learning Alliances use an end-to-end (producer to consumer) integrated research design, with stakeholders ranging from global food and commodities companies to NGO intermediaries to local farmer associations and smallholders. Innovative learning channels such as 'learning journeys' extend learning across diverse social worlds. Learning journeys are continuous and iterative, creating a robust network that builds both trust and collaborative relationships over time. The goal is to generate cohesion and capacity to deal with critical challenges as they emerge in the supply chain. A CIAT researcher noted that, "a problem at some point in the supply chain influences everyone. Working together using iterative learning processes contributes to more efficient and sustainable practices". This type of network channel mobilizes knowledge from in situ meetings and exchanges extending learning and adjustments in practice along relevant supply chain networks.

The role of national extensionists, intermediaries, farmer associations and other knowledge brokers were reported as playing a key role in mobilizing information. These organisations and agents have previously developed legitimacy in the communities and thereby become a great resource for mobilizing knowledge and innovation (Clark et al. 2011). For instance, extension agents from National Agricultural Research Services (NARS) play a particularly important 'boundary' role, operating with familiarity of contextual needs of the most vulnerable communities and having the trust and legitimacy within both scientific and agricultural communities (that is, they played the 'boundary-spanning role' found to be so key in successful projects) (Kristjanson et al. 2009). One interviewee noted that integration of local knowledge plays a fundamental role in identifying and co-creating solutions to development and adaptation challenges, and that extension agents often play an innovative role in the research process by ensuring local needs are accounted for. In the AfricaRice case, extension agents were given learning videos to take to relevant communities. They then monitored the impacts and reported back to the researchers.

Many CGIAR researchers referenced existing or projected partnerships with international non-governmental organisations that work closely with local organisations to optimize learning and impact. For example, a successful experience partnering with Catholic Relief Services (CRS) allowed CIAT to play a 'niche' research role and the NGO partners mobilized the outcomes to over 33,000 people. Linking international and national researchers directly to international and national NGOs, many with access to thousands of farmers, is thus an important 'scaling out' strategy.

Outcomes and measurable benefits of social learning approaches

In all cases described above, focusing on women, traditional knowledge and the rural poor facilitated learning about livelihood needs, preexisting knowledge and coping strategies under variable conditions. Projects such as CCAFS's 'climate-smart villages' and the CGIAR

Research Program on Aquatic Agricultural Systems (AAS), that explicitly account for longer-term planning to adapt to a changing climate and the need for 'gender transformative approaches' that encompass indigenous knowledge, technology and practices including among women and the poor, are building upon more than twenty years of experience showing that such approaches will be instrumental to their success.

For many of the projects it is too early to discern empirically what the longer-run measurable outcomes of a social learning approach are or will be. They do show that changes in knowledge, attitudes and skills are short-run outcomes. Based on these case studies, it is clear that engaging socially differentiated groups in the realm of knowledge production and decision support contributes substantive information and capacity that otherwise would not be available to researchers and stakeholders. All interviewees noted that providing venues for socially differentiated groups to express their needs and knowledge empowered them in the overall processes of making change. For instance, including women in participatory varietal selection (PVS) in Bangladesh is contributing to women's empowerment in the IRRI case study. In some cases, their inclusion has led to a greater willingness to communicate openly, demonstrating to men in the communities that they are valued and have information to share. The AfricaRice videos were circulated broadly, contributing to the ability to access information and to innovate on that information within context. This was viewed as an indicator of empowerment and a form of increased capacity to deal with emerging challenges. Certain researchers have identified women's groups as an untapped resource for engaging in and mobilizing knowledge for sustainable development (Kakota et al. 2011; Paris 2006).

Conclusions

Complex and dynamic interactions between poverty reduction, livelihood development and climate change challenges are benefiting from integrated social learning approaches. Across the CGIAR, we found that numerous projects are engaging socially differentiated groups (as a target group) or stakeholders (integrated in broader learning processes such as learning alliances), and are creating interfaces for exchange to occur among diverse knowledge bases and worldviews.

This indicates a shift from conventional one-directional knowledge dissemination approaches to bi-directional exchange and learning approaches. As noted above, the CGIAR has been involved in processes of social learning in agricultural research and development for many years through the use of participatory methods such as participatory varietal selection and, more recently, through learning alliances. In the cases studied, it is clear that these exchanges are contributing to greater understanding of the particular needs, values and norms in socially differentiated groups in different contexts. These approaches are part of an ongoing experiment for creating learning alliances that co-design relevant knowledge, and appropriately interface with socially differentiated groups (e.g. separate different castes of women in South Asia).

It is also clear that the value of these approaches does not stop at an enhanced understanding of diverse (and often disadvantaged) groups – substantive learning is also taking place. In particular, social learning is occurring in the increasingly relevant research questions being asked (e.g. men's versus women's varietal preferences) which, in all cases, is leading to greater relevance and legitimacy of how science is framed and used in context. The impacts of these approaches have yet to be evaluated for empirical results on empowerment, capacity, adoption rates and innovation successes, however.

Importantly, a more nuanced appreciation by researchers of the valuable and often overlooked roles (and potential roles) played by socially differentiated groups – women, indigenous and the poor – in agricultural research, and less tangible dimensions to livelihood, development and adaptive capacity work are a result in all the case studies. For instance, including women in varietal selection and making their roles in agricultural planning and production visible has generated learning about additional in-situ benefits and innovations that are contributing directly to increasing agricultural production and livelihoods (e.g. fast-cooking varieties to prevent periods of food insecurity; fodder for better animal health; fruit trees planted close to homesteads). As one of the researchers put it, "Generally, I think social learning is the way to go. We don't have the luxury of saying this cannot be done. The research world has become so interdependent. Centres cannot deny the fact that we need it. Different centres are at all different levels but I think they all intend to move to that direction". A number of other researchers argued that 'research for the sake of research' is no longer sufficient for addressing interdependent problems.

Establishing social learning interfaces and processes allows researchers and stakeholders to continuously co-construct research questions and knowledge, contributing to greater social networks and cohesion that can coordinate and adapt over time as new challenges and issues emerge. In this way, the approach builds the relevance of the research, and can contribute to the legitimacy (for example, trust) and greater willingness for users to adopt and innovate on research outcomes (Clark et al. 2011). As noted by Fazey et al., "Developing the ability to

learn flexibly in a variety of ways, contexts, and circumstances is an important element of developing adaptive capacity" (2007). This iterative, engaged approach can bring associated values, norms and practices to the fore helping to distinguish types of information considered relevant for particular users, more strategic questions for researchers and generate the legitimacy (and trustworthiness) required to co-create knowledge for results-oriented action.

Taken further, social learning processes that include socially differentiated groups, based on gender, age, socioeconomic strata, ethnicity or cultural considerations, can help to prioritize both needs and strategic interventions for sustainable poverty reduction and livelihoods development. Breaking the barriers of systemic marginalization from knowledge and power among these groups has the potential to build both short and longer-term adaptive capacity within and among vulnerable communities and across networks that share similar needs, values and norms.

There is a normative and moral imperative to address the short and long-term vulnerabilities among socially differentiated populations, communities and groups. The cases examined here demonstrate that many projects and programs are trying to address these vulnerabilities and that perhaps by more explicitly embracing a social learning approach they can help build adaptive capacity among socially differentiated groups. Specific forms and measures of learning towards more sustainable futures are still required (Folke et al. 2005; Vogel et al. 2007). Many of the projects investigated have created interfaces to overcome asymmetries in power and have contributed to two-way learning between researchers and farmers, contributing to changes in the types of questions being investigated and to changes in practice on the ground. Still, specific forms of learning require more examination. The ways social learning creates additional value that otherwise would not occur, for instance, requires more detailed analysis. Building upon this exploratory work and critically investigating in what form these projects continue, whether learning continues over time, to what extent increased relevance and legitimacy of questions and process increase outcomes, and how these can be assessed in terms of poverty reduction, food security and to build overall community resilience would be very valuable. The CGIAR is providing interfaces for these contexts to happen. Social learning experimentation is being undertaken in different areas of the CGIAR. In the time that this project was undertaken, for instance, the centres were examining more closely how gender approaches were, and could be, integrated into their methods. It is of interest to further investigate these critical sites of experimentation in order to continue to understand the benefits and trade-offs of social learning in more explicit detail and to refine methods that contribute to greater and more sustainable outcomes.

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Appendix 1: Identifying Social Differentiation and Social Learning in CGIAR Centres

Table 1: Legend for tracking social learning and social differentiation in CGIAR projects

Types of Learning	Interface with Users	Methodological Approaches
THIRD LOOP: Transformative learning Learning goal: What is the right thing to do?	Bi-directional exchange of knowledge, values, assumptions, norms and epistemologies. Boundaries are minimized between researchers and users in order to derive path forward for most relevant knowledge production. Co-frame and co-create research design and process that negotiates boundaries of relevance between users and researchers. **Key words** Co-design of relevant research; "co-frame" "identify of relevance/needs", "co-create" "partnerships" (contextual); "collaboration"	CO-PRODUCTION Purpose: Find out what are the right things to do. Users included at front end in processes to facilitate learning. Research is co-framed by an investigation of diverse needs, values, norms and assumptions among diverse actors. The goal is to co-construct meaning and the frame appropriate research questions and approaches. Boundary objects facilitate communication across social worlds and influence effectiveness of learning process and outcomes. Involves negotiation of values, norms and social structures that underlie operating assumptions and actions.
SECOND LOOP: Communicative Learning Learning goal: Are we doing the right things?	Participatory engagement of users/stakeholders in determining relevance and legitimacy of knowledge and approach. Typically involves prioritization of research goals, validation of research outcomes, or selection of options. Involves reflection on the assumptions that underlie	Purpose: How to do the right things? Assumes we can only understand complex, dynamic and multi-scale systems by involving the members of the system in the process itself. Knowledge-first approach emphasizing action and change in systems; processes of criteria selection, prioritization, and validation of research builds relevance, and particularly legitimacy of information. Actions designed to be embedded in social structures.

	action. **Key words:** "engagement", "participation", "identify and/or prioritize options", "capacity-building"	Participatory methods used to groundtruth information, ensure relevant communication, validate findings and outcomes findings, and be included in legitimate processes.
FIRST LOOP: Instrumental Learning Learning goal: Are we doing things right?	**Strategic communication of knowledge from researchers to users.** Involves communicating relevant knowledge to motivate change in skills, practices and actions to meet existing goals and expectations. **Key words:** "recommendations", "tool box"; "inform", "decision support", "targeted information"	Purpose: How to do things the right way? Research about users' needs frames how knowledge is communicated. Uses social scientific methodological approaches (that is, surveys, consultation, and so on) to transmit relevant knowledge to users.

Table 2. Identified projects: social differentiation and social learning (third loop)

CGIAR Centre	Project
Bioversity International	(a) Participatory approaches to the conservation and use of plant genetic resources http://www.bioversityinternational.org/fileadmin/bioversity/publications/pdfs/603_Participatory_approaches_to_the_conservation_and_use_of_plant_genetic_resources.pdf?cache=1330029027 (b) Seeds for Needs: Seeds for Needs project update – helping women farmers in Ethiopia adapt to climate change http://www.bioversityinternational.org/announcements/seeds_for_needs_ethiopia.html (c) Availability of plant genetic resources in times of climate and policy change http://www.ilri.cgiar.org/aggregator/sources/154

CIMMYT	(a) Drought tolerant maize in East Africa http://dtma.cimmyt.org/
CIP	(a) Climate Change Takes a Toll on Andean Potato Farming http://cipotato.org/press-room/press-releases/climate-change-takes-a-toll-on-andean-potato-farming http://cipotato.org/impacts/assessing-impact "Participative mapping for the evaluation of potato diversity in the Andes." 3rd prize in International Conservation Mapping Competition http://www.conservationgis.org/scgis/2011contestTraditional.html
WorldFish	(a) Bangladesh: Contributing to Fisheries and Aquaculture Adaptation to Climate Change in Bangladesh http://www.worldfishcenter.org/our-research/projects/contributing-fisheries-and-aquaculture-adaptation-climate-change-bangladesh (b) Climate Change Adaptation in the Lake Chilwa Basin, Malawi http://www.worldfishcenter.org/our-research/ongoing-projects/climate-change-adaptation-lake-chilwa-basin
AfricaRice	With West and Central African Women Rice Farmer Group Association, AfricaRice is laying the foundation of a grass-roots seed enterprise in Benin, Togo, and Senegal. The project, funded by the New Field Foundation, EU, and IFAD, aims to link smallholder women farmers to research, microfinance, and markets, opening up opportunities for them to become successful businesswomen in producing and marketing seeds. Participatory Learning and Action Research (PLAR) approach http://www.AfricaRice.org/AfricaRice/guide-video.asp Innovation systems; rural learning; impact http://www.AfricaRice.cgiar.org/AfricaRice/story-women.asp

Table 3. Identified projects: Social learning innovation (second loop)

CGIAR Centre	Project
CIAT	(a) Adaptation by agricultural communities to climate change through participatory and supply chain inclusive management (2011) http://dapa.ciat.cgiar.org/wp-content/uploads/2011/07/Methodology-Report.pdf (b) Coffee under pressure project http://dapa.ciat.cgiar.org/coffee-under-pressure
CIMMYT| Bioversity (IPGRI)	Bioversity – current work http://www.bioversityinternational.org/announcements/assessing_the_success_of_on_farm_conservation_projects.html "Effective delivery of outputs to target resource-poor farmers" - CIMMYT http://apps.cimmyt.org/english/wps/news/2006/feb/mexican_farmers.htm
CIMMYT	Wheat – Global alliance for improving food security and the livelihoods of the resource-poor in the developing world http://www.cimmyt.org/en/component/docman/doc_view/503-wheat-global-alliance-for-improving-food-security-and-the-livelihoods-of-the-resource-poor-in-the- • Targeted beneficiaries (p.10)
IFPRI	The **Strategic Analysis and Knowledge Support System (SAKSS)** compiles, analyses, and disseminates data, information, and tools to help governments and partners better design, implement, and evaluate their agriculture and rural development strategies. http://www.ifpri.org/book-38/node/5229 http://www.ifpri.org/book-38/ourwork/program/country-development-strategy
IWMI	Adaptation to climate change: an integrated science-stakeholder-policy approach to develop an adaptation framework for the water and agriculture sectors in Indian states of Andhra Pradesh and Tamilnadu (2012-2016) http://www.iwmi.cgiar.org/Projects/ShowProjects.aspx?C=023-11-01-NEA

ICRAF	Taking the Heat out of Carbon http://worldagroforestry.org/sites/default/files/India%20carbon%20booklet-15th%20Feb.pdf OR http://climate-l.iisd.org/news/icraf-reports-on-smallholder-agroforestry-carbon-project-in-india/ http://ccafs.cgiar.org/sites/default/files/assets/docs/icraf-comms_carbon_pb.pdf
CIAT	Facilitation of the Regional Capacity Building Initiative on Seed Systems for Latin America and the Caribbean. http://www.ciat.cgiar.org/Newsroom/Pages/capacity_strengthening.aspx
CIAT	Climate change and gender: What role? http://www.ciat.cgiar.org/work/Africa/Documents/WD222_WEB_FINAL.pdf

Table 4. Identified projects: Social learning (first loop)

Unit	Project
CIFOR	Leveling the Playing Field http://www.cifor.org/lpf/_ref/project/action.htm Action Research section http://www.cifor.org/lpf/_ref/project/approach.htm - purple projects - framing criteria and indicators of success
ICARDA	Participatory Learning and Action Research Approach (PLAR) for Integrated Soil Fertility Management (ISFM): http://www.icarda.org/participatory_research/learning.htm
ICRISAT	Participatory Action Research on Climate Change http://www.icrisat.org/newsroom/latest-news/happenings/happenings1508.htm
ILRI	Multi-actor systems as entry point for action research – Burkina Faso & Ghana http://waterandfood.org/2011/10/21/multi-actor-systems-as-entry-point-for-action-research-burkina-faso-ghana/
IRRI	Global Rice Science Partnership gives attention to how gender will be tackled in all its research activities.

Table 5. Relevant non-CG Organisations emphasising social differentiation

Unit	Project
WWF	Pro-poor Rewards for Environmental Services in Africa Equitable payment for watershed services scheme in Naivasha (WWF-CARE) http://presa.worldagroforestry.org/blog/category/news/ "Gender equity and involvement of marginalised community in socio-economic development have been realized".
Sustainable Food Laboratory	http://www.sustainablefoodlab.org/
CARE International	International Poverty, Environment and Climate Change Network (PECCN) http://www.careclimatechange.org/ Adaptation Learning Programme for Africa Climate Vulnerability and Capacity Analysis Handbook http://www.careclimatechange.org/toolkits

Appendix 2: Interview Template

INTERVIEW TEMPLATE

PHASE 1: Targeted research impacts (1° Are we doing things right?)

A. What is the desired impact of your research?
B. What methods did you use to frame the context and parameters of your research question (lit. review, participatory workshop)?
a. How did you identify this as a relevant need or gap to be filled?
C. What types of groups are you targeting and why?

PHASE 2: Contribution to participatory action research and socially differentiated audiences (2° Are we doing the right things?)

A. In your particular research, have age, gender, socioeconomic status, or other social/cultural signifiers played a role in determining how information is interpreted and used?
B. What strategies were used to target relevant socially differentiated groups and/or communities of practice?
C. At what stage of the research were these groups engaged (for example, framing, iteratively throughout, selection of priority options, dissemination, and so on)?
D. What engagement approaches were used?
E. Would you say these approaches have or have not motivated changes in practice?
F. In your view, what approaches are important for building capacity among these groups that have already or have the potential to motivate or could motivate adaptive changes in their practices?
G. What role has involving relevant networks played in disseminating and mobilizing knowledge to appropriate actors (transdisciplinary, multi-scalar, and so on)?
a. Was this particular research connected to relevant decision institutions/policies that helped to operationalize the research?
H. Is there any evidence of concerted action and change on the ground? If so, what is it?

PHASE 3. Contribution to social learning toward changes in practice (3° What are the right things to do?)

External

A. In your research, how are differences in attitudes, assumptions and norms among the producers and beneficiaries of knowledge negotiated/facilitated?
a. Are these differences used to inform the research? If so, how?
b. If not, are these differences viewed as a barrier inhibiting the impact of the research?
B. Have you designed evaluative criteria for what beneficial changes in practice look like?
a. Were the targeted social groups involved in this exercise?
b. Do the criteria account for any trade-offs associated with the impacts of the research?
C. In your view what are the critical enabling conditions that give rise to or could give rise to these changes?

a. What are the critical barriers that need(ed) to be overcome?

Internal

A. Have you or do you intend to adapt these tools and approaches to use in future research in order to enhance learning and communication amongst the various stakeholders/social groups?
a. Do you view this as a necessary adaptation that may affect the overall impact of your research?
b. Are their special learning and communication approaches or tools that have been effective at changing practices of particular socially differentiated audiences?
B. To what extent does your centre as a whole reflect on and integrate what you have learned from working with such groups?
C. Are there lessons from your research that could be used to spur a broader transition towards social learning in your Center or the CG more broadly? What are they?

Appendix 3: Nine case study findings focused on approaches to social learning including gender, traditional knowledge and pro-poor

Gender approaches

IRRI: Stress tolerant for Africa and South Asia (Phase 2)

Context: This project developed a standardized data collection procedure to make women's participation in rice cultivation visible. There is a need to reduce the gap between men and women in terms of access to technologies, technical knowledge and capacity enhancing programs. Research on family cultivation among the rural poor, acknowledges women as farmers. Though discriminated against, on closer examination they are active participants in breeding, cultivation and harvesting. IRRI is interested in shifting research from yield to market-oriented breeding but there is a need to better understand the demand-side context – what types of varieties and qualities are valued. Knowledge and technologies that influence livelihood progress typically go to landowners – men. The goal is to use aggregated data that quantify female labour contributions to demonstrate to rice breeding researchers the ways women both influence and are influenced by technologies within the rice production system. The emphasis is on how to ensure women farmers have access to technologies that both increase livelihoods and capacity and productivity in the broader rice production system. For instance, women who take care of livestock prefer varieties with long stock for quality animal fodder. At the household scale women want varieties that can cook faster and remain softer throughout the day in order to reduce overall time spent cooking in order to focus on other activities.

Interface

Baseline data is collected in 11 rice producing communities in Bangladesh and Nepal to quantify primary and secondary labour contributions made by women in rice production. This is done in order to make these contributions visible to breeders and to transmit relevant information about preferred varieties from the communities back to breeders in the research community.

Through the participatory varietal selection protocol, IRRI researchers and NARS intermediaries are encouraged to ensure that 30% of participants involved in varietal selection methods are women from farming households. Women are invited to vote on top two varieties and are separately consulted to better understand why specific varieties were chosen.

Learning

Types of varieties depend on end-use among women (including animal fodder, household food source or yields and harvesting for market). Criteria used for varietal selection are different between men and women and between those with varied socioeconomic needs. This information was exchanged through participatory process. Women choose varieties that cook faster, or that can be used for other purposes such as snacks, and that are easier to harvest and thresh. The poor

choose coarse grain to fill stomachs and finer grains are chosen for market. This information provides clues to breeders about contextual needs, values and norms and the types of technologies are relevant and legitimate within these contexts and also the types of strategies employed under climate variability.

Including women in the exchange of information contributes to changes in traditional norms, "loosened rigidity". In certain cultures such as Bangladesh, women need to be consulted separately by female researchers. In India, women from upper and lower castes are consulted separately. Women are speaking about their preferences more openly and getting access to technical information and seeds that they otherwise would not have access to. This is changing both the nature of research, assumptions about women's invisible role in agriculture, and also in cultural norms demonstrating that women have relevant knowledge and an ability to influence technical learning and uptake. This can be seen in the increase of women's self-help groups in India and the 'empowerment' of women's voice in Bangladesh which Paris attributes to the rise of micro-credit NGOs providing women with opportunity.

Learning extended to how women and men cope differently to climate variability:

- Women are anticipatory, collecting surplus supplies such as wood and cow dung, to prepare for droughts or floods; men are focused on production, getting the best yield and returns in the short-term.
- Women develop rooted social networks to cope after drought/flood events; men seek opportunities elsewhere.

This learning provides information about current adaptive strategies that can help identify strategic vulnerability reduction and capacity-building opportunities to climate variability over the short and long term.

Channel

IRRI has created a position to assess consumer demand in the supply value chain. Breeders have changed and are breeding for market rather than yield now. In this way, IRRI is breeding for consumers so differentiated characteristics are becoming increasingly important.

Outcome

A participatory varietal selection protocol, including guidance on ways of including women and seeking participation at appropriate times (harvest), was developed to be used by extension agents from National Adaptation Research Services (NARS). Monitoring is required both to see how women are being included and to what extent this inclusion is influencing learning in the development of varieties and uptake of seeds used by women (both are becoming greater requirements from donors). There are still cultural difficulties with intermediaries using

lack of budget as an excuse for not inviting women.

There is anecdotal evidence that the beneficial qualities of particular seeds are transmitted along robust social networks of women. Further monitoring of what types of learning travels and how far it extends could contribute to insights about the potential and the ways to accelerate adaptive capacity using women's networks.

AfricaRice: Participatory Learning for Action Research (PLAR)

Context: Increased adoption of technologies and improved research in West Africa emphasising gender inclusion for adopting appropriate rice varieties for Upland, Lowland and irrigated ecologies. In this research, farmers experiment with varieties and give feedback about how to continue to focus on appropriate technologies. This project strengthens links between the informal seed sector in West Africa with women's empowerment. It also links women smallholder farmers to research, microfinance and markets. And, most important, it enables women's different and diverse preferences to be expressed, having long-lasting impacts on research and local institutions.

Interface	Participatory varietal selection engages both men and women in criteria selection for rice varieties. Participatory learning and action research is used. Farmers are taught to record what is being observed and then through monthly farmer meetings they come together to interpret this information in groups. Researchers facilitate these meetings in order to bring out farmer knowledge and to better understand and learn about what the research needs are. Community networks are created.
Learning	Farmer-to-farmer learning, bringing 20-25 farmers together to exchange, knowledge, attitudes, experiences and practices. Provides clues to researchers about needs, technologies and appropriate varieties in particular ecologies. Different preferences for rice varieties between men and women. Bring women's needs into the framing of appropriate varieties. In difficult times, men leave the community to find "greener pastures" whereas women cannot leave. Different requirements.
Channel	Farmer-to-farmer learning videos capture farmer innovations and transfer across communities, scaling across relevant regions and geographies. These are translated into appropriate languages. National extensionists and non-governmental organisations were used to transmit videos. Each are required to track where the videos go and facilitate feedback from the communities to provide clues about their relevance and use. This communication strategy has proven to be an "appropriate learning tool". When tested in Benin and Togo, it was found to be significantly more effective in changing behaviours than conventional innovation training and visit systems of the late eighties and nineties.

Outcome Appropriate varieties for conditions and different varieties for women and men. Learning about how to care for plots, faster maturing varieties (in four African countries) to address crucial period of hunger. Now identifying changes required for their own technologies and practices. For instance, for boiling rice women were using 25kg buckets but requested 200-300 kg containers to make their work easier. Women who watched the video enhanced their creativity and adapted technologies to change their own environment – viewed as a form of empowerment.

Worldfish | IWMI | Bioversity: Gender transformative approach in CGIAR Research Program 3.1 on Aquatic Agricultural Systems

Context: The approach is currently being adopted in the implementation of the CGIAR Research Program on Aquatic Agricultural Systems. The approach encourages critical awareness of gender roles and norms among men and women, challenges the distribution of resources and allocation of duties between men and women, and promotes the position of women while addressing power relationships between women and others in the community (Interagency Gender Working Group, USAID). The CCAFS Smart Farm (SF) Project and Aquatic Agricultural Systems (AAS) are looking at strategies to address climate-related challenges. They are exploring viable gender-differentiated strategies to enhance the resilience, productivity and diversity of aquaculture systems in weather and water challenged contexts, including differentiated research needs in improving fish circulation, homestead pond management with women and integrating farming systems such as homestead vertical agriculture systems. The goal is ultimately to simultaneously help women and men farmers and fisherfolk increase their adaptive capacity and livelihoods. Worldfish as a whole is interested in gender transformative approaches to minimize vulnerabilities experienced by socially differentiated users. Additional links: CCAFS Smart Farm Project, Bangladesh; CRP 3.1 Aquaculture and Agricultural Systems

Interface SF – researchers and communities exchange information, needs, ideas and jointly identify research questions. Involves a group-oriented visioning process between researchers and farmers/fisherfolk to identify needs and ways to achieve certain impacts. Men and women are approached separately and are strongly encouraged to identify their research needs.

AAS – researchers are going to villages and talking to specific individuals about research needs but have not assessed the types of socially differentiated groups that need to be targeted.

Learning SF – Farmers are being trained by researchers to collect and interpret data so they are more independent in assessing their needs and have more direct decision-making about how to adapt to climate change and other drivers of change.

AAS – Farmers are being trained on implementing micro-habitats in rice fields where fish can thrive even after the intense rains.

WorldFish is getting school children involved in learning about research and GIS mapping so they can also take part in adapting to climate change in their own villages, so they do not need to migrate to large cities for alternative sources of income in the future.

Channels Knowledge networks, where scientists work with farmers' networks in order to better identify needs and appropriate approaches on the ground.

Outcome Having senior management involved in gender approaches demonstrates that this is an issue that is being taken seriously across the centre.

CIMMYT International Maize and Wheat Improvement Centre: Drought tolerant maize for Africa project

Context: Up to 65% of arable land in Africa is dedicated to maize production. It is a major commodity and source of food yet the constraint is drought, disease and weeds. The project is trying to make 100 varieties of maize in Africa that we are trying to make drought tolerant. Gender has become an important issue for helping the least privileged groups. Other differentiations such as level of education and wealth are important as well.

Interface Farmers are engaged through long-term participatory varietal selection.

Learning Learning occurs between researchers and farmers, including women, about appropriate varieties in the first 1 or 2 seasons. Once varieties are identified, you ask farmers to experiment with ½ dozen to compare to the varieties they are used to (that is, commercial, local). They plant and manage (timely planting, right stand, population, fertilizer/input application). They are then asked at different stages, what variety they would choose and why. For instance, benefits relate to resistance to drought, aesthetics, germination.

Channels Stories about learning and knowledge are used to expand that knowledge to farmers/beneficiaries, by demonstrating learning and impact/results.

Local media is used, both print media and radio. 80% of farmers are exposed to the radio, a useful communication. Bulletins are used to target farmers. Journalists are invited to national meetings to get exposure to the issues (that is, Farm Radio). Capacity building is occurring at different levels. Trainers of trainers deal with local situations via direct training and on-farm trial/research. National programs help train graduate students. Farmers are getting exposed to what we are doing – use of new technologies and varieties, and practices.

Outcome Now mainstreaming more optimal varieties on the basis of resistance to drought, diseases, and weeds. Lessons learned in the storytelling phase of the project then become part of a new learning cycle to address different issues.

World Wildlife Fund (WWF) | CARE International: Payment for Ecosystem Services Pilot Project in Lake Naivasha, Kenya: In partnership with World AgroForestry Centre (ICRAF) Pro-Poor Rewards for Environmental Services in Africa (PRESA) in Upper Tana

The need to reduce sediment load in rivers is linked with livelihood improvements in the upper catchment of Navaisha Lake. Hydrological studies are carried out to determine most seriously degraded areas with highest amount of silt load. The project addresses siltation as a result of unsustainable land-use practices. Researchers worked with smallholders to design a business case in order to change current practices in a feasible manner. The costs and opportunity costs of conservation interventions to the farmer were considered alongside the ability to recover those costs over time. The farmers are rewarded for planting trees and changing upper catchment practices by downstream beneficiaries. Women and children do the majority of family agriculture therefore the project considered innovative benefit-sharing to extend benefits to the family.

Interface Researchers, members of local water associations and farmers were brought together in this project to define the parameters and conditions of appropriate and relevant soil and water conservation measures and the business case and financing measures needed for implementation. Community members were identified through the local water association, helping to identify degraded farms/sites, mapping farms, selecting soil and water conservation methods presented from options. Local farmers, including women, from the upper catchment were invited to join the scheme and the decision-making provided they were willing to undertake innovations proposed.

Learning Farmers required practical training in order to track the benefits associated with changing practices. This training included record-keeping on crop types, yields, inputs, sales and overall water and soil management strategies.

Women were included in decisions with men, about crops to be grown, fodder crops for livestock and contributed insights about how to increase in-situ benefits. For instance, instead of growing trees, it was decided that fruit trees would be grown near the homesteads, becoming an additional crop for the household and the market.

It was agreed, by both men and women, that vouchers would be used, rather than cash, in order to prevent discretionary spending by the men of the households and to promote broader household and farm benefits. The vouchers paid for by downstream beneficiaries and are redeemable for agricultural supplies, including access to good seeds that can be used both for food security and agricultural production.

Channel Farmer-to-farmer learning was encouraged through site visits.

ICRAF is now participating with WWF in another PES scheme in the Kana watershed. This partnership development will ensure that farmers get the ideal seeds for their bio-ecological zones and

accounting for possible extreme climatic conditions (wet/dry).

There is a hope that inclusion of ICRAF and national-scale partners, will build these pilots into a national program.

Outcome Initially farmers were not convinced they needed to make changes. Now different households are experiencing different benefits, including increased agricultural productivity, better fodder contributing to greater milk supply in cows, and additional funds to pay school fees for their children.

Farmers are performing their own on-farm accounting, making adjustments to inputs and outputs where necessary and are now supplementing the data for researchers by doing their own water monitoring.

Traditional knowledge approaches

International Potato Centre (CIP): Impacts of climate change take a toll on Andean potato farmers: Participative mapping for the evaluation of potato diversity in the Andes

Context: Newer farming practices that favour monoculture are dependent on the use of pesticides and chemicals to stave off plagues. Along with human health risks associated with the use of these products, bacteria, virus and pests develop resistance to chemicals and pesticides over time. Also new strains develop periodically. These risks underscore the importance of conserving a diverse pool of potato varieties that may hold natural resistances in their genes. This project is interested in understanding potato biodiversity and what the dynamics of diversity are in higher elevations. More than 10 years of Geographic Information System (GIS) mapping reveals that farmers have ascended the Andes 150 meters during the past 30 years to escape agricultural diseases and pests due to increasing temperatures.

Interface Researchers and farmers work together via participatory mapping (80-90% participate). High-resolution satellite images enable farmers to identify their plots. Local knowledge on what is happening in terms of impacts, crop diversity and vulnerabilities (i.e. degradation, pest outbreaks, climate change, etc.) is being catalogued and cross-referenced with maps on a plot-by-plot basis. This includes coidentifying most vulnerable sites on maps (to degradation, pest outbreaks, climate change, etc.). The elderly and women are interviewed for local knowledge.

Learning Researchers are learning about varieties of potato never documented as well as traditional food security practices at altitude, where high variability requires diversity of varieties to ensure some level of food security. Even commercial farmers have plots devoted to traditional multispecies varieties in order to ensure food security and survival. Elders and women asked for their knowledge; elders know of varieties that have been lost and women are very knowledgeable of the varieties and diversity.

Channel Learning is happening community by community**.** Farmers hear of

the project and are interested in the project and invite the researchers to come to their community (more than 20 communities in the last five years).

Outcome This means that a diverse "in situ" genebank is widely available in the Peruvian highlands for scientists to research gene resistance and to broaden the range of diversity from which to address adaptive strategies to climate impacts on agriculture. Farmers are being empowered, given maps, soon to be followed by computers, and encouraged to observe and document changes, including pest, soil and climate variability. The project has built trust among researchers and communities, which, it is hoped, will continue and will be funding dependent.

Pro-poor approaches

International Center for Tropical Agriculture (CIAT): Learning alliances: An approach for building multistakeholder innovation systems, and Rural Agroenterprise Development Project

Context: The Learning Alliance looks for leverage points for social learning in value chain systems and analysis linking rural farmers with markets. It uses an approach for building multistakeholder innovation systems that develop collaborative teams and learning platforms with development NGOs and their partners in order to learn over time about ways to link small farmholders to markets. The Rural Agroenterprise Development Project (1995) in cassava had tremendous success, however efforts to deliver tools and methods more broadly through a manual did not have the extent originally hoped. Learning platforms were developed to ensure greater relevance and appropriateness of knowledge and to extend the mobility of different knowledge, tools and approaches.

Interface Co-learning platforms link diverse actors and knowledges in agricultural value chain through workshops. Different capacities, attitudes and knowledges are brought together to learn about one anothers' needs and capacities within value-chain analyses. A multiplicity of stakeholders are included ranging from buyers, supermarkets, banks, producer associations, cooperatives brought together in a learning platform to co-learn about what the needs are along the value chain. Through longer-term partnerships, this alliance "supports ongoing dialogue between researchers and development actors on lessons learned, innovations, adaptations and emerging demands for new research" (CIAT 2010).

Learning Co-learning is undertaken whereby all actors exchange and mobilize knowledge to identify needs, values and norms within value-chain systems. Lundy notes, "We're able to add value to development projects by identifying gaps and filling them in a pragmatic fashion" (pers. comm. 2012). This learning is done in an iterative fashion, pulling out basic principles that can be used as prototypes to be adapted and used elsewhere. NGO's networks are leveraged to

mobilize tools, systems or practices.

Channel Intermediaries, private partners, farmer associations all become part of the learning agenda. In this way there is learning within the institutions (e.g. Unilever) and learning that extends across networks. Through the use of Learning Alliances, CIAT was able to "radically expand its reach to include organisations affecting the livelihoods of nearly 33,000 farm families in Central America, assist Catholic Relief Services (CRS) in building the enterprise development skills of employees in more than 35 countries, and provide a tested co-learning method to other agencies interested in similar action learning processes in water and sanitation" (CIAT 2010).

Outcome Outcomes from this work include improved multi-organisational partnerships, more effective development projects and the approval of more than $40 million of new grants in Central America to Learning Alliance partners.

International Centre for Tropical Agriculture (CIAT): Adaptation by agricultural communities to climate change through participatory and supply chain inclusive management (2011) and Coffee Under Pressure projects

Context: Vulnerability of farmers equals vulnerability of supply chain. Inclusive management involves those that contribute to growing, selling and changing strategies. Crop modelling under different climate conditions requires knowledge of who's growing, selling and involved in the supply chain. It also requires an analysis of who the beneficiaries of the value chain are and who will be adversely affected by changes in climate and in practice in order to identify appropriate adaptation strategies. Gender analysis is critical.

Interface Researchers and stakeholders such as farmers, extensionists, local governments, and ministers are brought together in workshops to discuss history, crop types and harvesting methods and climate change perceptions. Strategies such as visual questionnaires, maps, and models of 20-year crop/climate projections are used to engage and discuss how resources change over time.

Learning Knowledge and networks from collaborative teams are leveraged in order to mobilize practical tools, systems and practices that build adaptive capacity among the poor and among women. Young people understand much faster about climate change. Youth and women are more engaged in participatory workshops. Interactive approaches feed information back into more relevant crop/climate models.

Channel Working with intermediaries such as Oxfam has contributed to ways of integrating gender-sensitive methods into the research process. The collaboration has provided Oxfam with CIAT's relevant

crop/climate expertise and information, and providing an avenue for research to be disseminated more broadly.

Engaging with global food companies has typically included Corporate Social Responsibility departments. There is a recognized need that corporate buyers need to be brought into the collaborations in order to mainstream sustainable supply chains more broadly.

A gender expert within CIAT is facilitating learning about the need for differentiated gender components in research. Agronomists are paying attention and using this resource now that the need has been identified within the institution.

Outcome Learning that women play a significant role in the supply chain but do not get shares of revenue leads to new research questions about what varieties and practices contribute to more visible and greater involvement. Oxfam included post-harvest facilities in the supply chain, formalizing women's involvement in the supply chain and ability to generate income.

Funding is viewed as a primary barrier to longer term learning cycles and for building continuous partnerships and trust over time. CIAT is working collaboratively with supply chain stakeholders and making links with large development NGOs, to use one part (approx. 8%) of their funding for relevant scientific research that applies to local development projects. Where possible, it is expected that sampling design and the innovative methodologies developed can then be rolled out across extensive NGO networks, including Oxfam and Catholic Relief Services.

International Centre for Tropical Agriculture (CIAT) | International Potato Centre (CIP) | Bioversity International | International Institute for Tropical Agriculture (IITA) CRP 3.4 Roots, Tubers and Bananas for Food Security and Income

Aims to increase availability and use of high-quality seed, thus contributing to agricultural development and food security. The Platform uses available information and technologies, brings key stakeholders of seed systems in contact with knowledge, scientific tools and best practices, creates favourable learning conditions and provides the necessary elements for stakeholders to apply this knowledge in decision-making (Gonsalves 2012).

Interface CGIAR researchers are becoming more integrated in local knowledge exchange but not happening fast enough. For instance, decision support and analysis and soils, water and ecosystems researchers are very receptive but breeding and biotech is very far away.

Learning CGIAR researchers need to identify vulnerable groups and listen, in order to make linkages between what is heard and the research that is done and to include communities and groups in prioritization of needs.

	Family is a unit in agriculture. Family members, women and youth, are involved in production, post-harvest and market activities. The Strategic Research Framework of the CGIAR is changing the institutional approach. Now responsible for development outcomes, impact pathways or interim development outcomes over three years. Receptive research is being done in CGIAR but not moving quickly enough. For instance, there have been no significant differences in nutrition or farmers' changes in practices to adapt to climate change, but this takes time to trickle down.
Channel	Role of extension agents is critical for transmitting relevant information from researcher to community and back to researcher.
Outcome	Tracking outcomes is difficult. CGIAR's intermediate development outcomes do not provide a sufficient amount of time to anticipate outcomes beyond demonstration projects (annually or 3 years). Need more time to track and account for mainstreamed outcomes.

Sustainable Food Lab | International Centre for Tropical CIAT: Participatory Value Chain Analyses and Sustainable Food Lab Toolbox

Context: To examine global food production value chain interventions for local development impact. Poverty and agro-potential assessments are done to identify key intervention areas to reduce poverty and build development opportunities by linking smallholder farmers with local and global markets. Innovative business models intervene in global to local supply chain in order to distribute risks and rewards more evenly.

Interface	Global food companies, NGOs, local organisations and smallholder farmers are connected via annual meetings, field trips, quarterly monitoring reports to work together to identify key supply chain interventions.
Learning	Companies, local organisations and implementing partners and smallholders/producers are brought together to identify specific supply-chain interventions, while also forming longer-term learning partnerships. Design impact analyses that include measures for poverty reduction, participatory criteria and interviews to better understand learning and outcomes.
Channel	Iterative learning journeys establish long-term partnerships and trust-building over time. NGOs and local implementing organisations work with farmer organisations and women's groups to identify and monitor development impacts for most vulnerable. Executive field trips provide decision makers with firsthand experiences that are often translated back as changes in the organisation.
Outcome	New business model to increase development impact. Learning journeys and local implementing partners with women's groups to reduce vulnerability, particularly food insecurity. Women noted that many

	households in communities were exposed to food insecurity for periods of up to 3 months, before crops come to fruition. The learning was transmitted directly to executive levels and new seeds were transferred.

International Food Policy Research Institute: Regional Strategic Analysis and Knowledge Support System (Re-SAKSS)

Interface	The Regional Strategic Analysis and Knowledge Support System (ReSAKSS) is an Africa-wide network established to provide readily available analysis, data, and tools of the highest quality to promote evidence-based decision-making, improve awareness of the role of agriculture for development in Africa, fill knowledge gaps, promote dialogue, and facilitate the benchmarking and review processes associated with the CAADP agenda.
Interface	It aims to improve partnerships and dialogue partnerships with the Comprehensive Africa Agriculture Development Programme (CAADP) agenda of the New Partnership for Africa's Development (NEPAD) and African Union (AU) and other regional agricultural development initiatives in Africa.
Learning	Need for more contextually relevant and socially differentiated data and research.
Outcome	NetMap Tool – level of influence in a network and how they are linked; target mavens in the networks for policy change

RESEARCH PROGRAM ON
Climate Change, Agriculture and Food Security

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