

# **CONTEXT IS EVERYTHING:**

A CCER On Impact Assessment At  
International Livestock Research  
Institute (ILRI)

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## ACRONYMS

<b>ACIAR</b>	Australian Centre for International Agricultural Research
<b>AfDB</b>	African Development Bank
<b>ASARECA</b>	Association for Strengthening Agricultural Research in Eastern and Central Africa
<b>AU-IBAR</b>	African Union's Inter-African Bureau of Animal Resources
<b>BECA</b>	Biosciences in East and Central Africa
<b>CCER</b>	Center-Commissioned External Review
<b>CGIAR</b>	Consultative Group on International Agricultural Research
<b>CIAT</b>	International Centre for Tropical Agriculture
<b>CSO</b>	Civil Society Organization
<b>DFID</b>	United Kingdom Department For International Development
<b>EADD</b>	East Africa Dairy Development
<b>eaIA</b>	Ex-ante Impact Assessment
<b>epIA</b>	Ex-post Impact Assessment
<b>EPMR</b>	External Programme and Management Review
<b>FAO</b>	Food and Agriculture Organization
<b>FAP</b>	Forage Extension Project
<b>FARA</b>	Forum for Agricultural Research in Africa
<b>FIP</b>	Forage Innovation Project
<b>GEF</b>	Global Environmental Fund
<b>IA</b>	Impact Assessment
<b>ICRAF</b>	International Centre for Research in Agroforestry
<b>IFAD</b>	International Fund for Agricultural Development
<b>ILRI</b>	International Livestock Research Institute
<b>IS</b>	Innovation Systems
<b>IPMAS</b>	Integrating Poor to Market System
<b>M&amp;E</b>	Monitoring and Evaluation
<b>M&amp;L</b>	Monitoring and Learning
<b>OIE</b>	World Organization for Animal Health
<b>OP</b>	Operating Projects
<b>PLE</b>	People, Livestock and Environment
<b>PROGEBE</b>	Sustainable Management of Globally Significant Endemic Ruminant Livestock in West Africa
<b>R&amp;D</b>	Research and Development
<b>RCT</b>	Randomized Controlled Trial
<b>R4D</b>	Research for Development
<b>RMG</b>	Research Methods Group
<b>ROI</b>	Return on Investment
<b>SADC</b>	Southern African Development Community
<b>SDP</b>	Smallholder Dairy Project
<b>SPIA</b>	Standing Panel on Impact Assessment
<b>TI</b>	Targeting and Innovation
<b>TOR</b>	Terms of Reference
<b>USAID</b>	United States Agency for International Development

## Introduction

Impact forms the bottom line of international agricultural research. It provides the rationale for investment, the organizational framework for the research, the character of the network of partnerships, and the motivation for staff. Impact assessment (IA) in turn provides the metric which informs the multitude of decisions, strategies and tactics by which impact is attained and research investments are justified--with a much weaker claim that ex-post IA provides a practical basis for justifying and allocating future research investment (Raitzer and Winkel 2005). However, as research of the CGIAR has expanded into heterogeneous, rainfed environments and complex farming systems often not well supported by institutional services or markets, achieving impact has become more difficult, more uncertain and more geographically circumscribed-- and in such constrained environments often purely project dependent. For those Centers working on complex production and natural resource management systems in such environments, the linkage of accountability with some measure of impact on final development objectives has shifted a sizable proportion of Center activities into research *on* development, if not development activities per se. *How* to achieve impact becomes a critical part of a Center's research agenda and impact assessment expands from just measuring impacts at the end of an R&D process to its utilization in planning, management, project design, and evaluation or what is now often termed a results-based strategy and evaluation framework.

This review evaluates IA at the International Livestock Research Institute (ILRI). ILRI's research focuses on improving the performance of complex livestock production systems operating in marginal agroclimatic, institutional, or economic environments. ILRI's research agenda continues to evolve in response to a dynamic, creative tension between its role in framing the global biological and natural resource scientific agenda on livestock production systems in developing countries and its role in understanding how those systems will intensify in different development contexts and impact, particularly on poor households, can be accelerated. ILRI is thus a particularly interesting Center in which to evaluate its IA activities, given the interacting production and natural resource management issues in livestock systems, its geographic focus on sub-Saharan Africa and South Asia, and the complexities of addressing poverty through livestock production systems.<sup>1</sup> This review is thus guided by two objectives:

1. To evaluate the impact assessment process itself; particularly, the efficacy of the methods employed, how IA is organized within the institute, and most importantly its role in better informed management decisions.
2. To evaluate how impact assessment across the institute can increase the probability of impact, namely assessing the information and research base

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<sup>1</sup> The constraints in generating impact on final development objectives through livestock research are many and complex. Firstly, increasing productivity in livestock systems involves an interaction between genetic, nutrition and health interventions and improving the genetics usually implies significant increases in management of the health and nutrition components. Secondly, livestock production systems are remarkably heterogeneous in a target region such as sub-Saharan Africa, and require quite specific interventions in either market systems or production systems in order to achieve impact. Finally, ILRI focuses on achieving its impact on poverty objectives through market-led approaches, with the corollary of integrating poor households into expanding livestock markets. However, participation in high value markets oriented to urban consumers tend to favour farms with critical levels of land and capital, good access to markets, and educational levels that support the improved management, that is characteristics usually lacking in poor rural households.

and the partnership arrangements that enhance ILRI's ability to achieve impact.

These questions can be set within three larger issues, that are as well central to the CCGIAR's change and reform process and which will influence ILRI's approach to IA in the near term future. They will not be addressed directly in the review, but they do provide themes that run through the report. These are:

1. How does ILRI frame, organize, and implement research for development (R4D) work and what balance is appropriate in its overall project portfolio? Is there a research agenda which informs this work and can it be integrated into projects which are designed to achieve more explicit development objectives?
2. Is ILRI moving toward defining impact targets by which the Center and its partners might be evaluated, that is a precursor to what could be viewed as a results framework? This is analogous to what in this report is termed integrated impact assessment, where impact targets are incorporated into ex-ante planning, monitoring and evaluation systems that inform management and ex-post impact evaluation. A critical issue here is what internal and partner capacity needs to be built and sustained to undertake such an integrated approach, particularly when such capacity will principally rely on core resources.
3. What are the partnership arrangements that are necessary to achieve impact, how are capacities built (and financed), and do innovation system frameworks provide a basis for re-conceptualizing and reinvigorating such partnership arrangements?

## **1. Making ILRI's Impact Pathways Operational**

ILRI's 2003 Strategic Plan sets as its principal goal "to reduce poverty and make sustainable development possible for poor livestock keepers, their families and the communities in which they live." To achieve this impact objective ILRI identifies three principal pathways out of poverty around which the Center organizes its research and development activities, namely:

1. Securing the current and future assets of the poor,
2. Sustainably improving the productivity of agricultural systems of the poor, and
3. Encouraging participation of the poor in livestock-related markets.

These pathways are not necessarily independent of one another, but rather interact. Access to markets is often necessary to encourage investment in productivity enhancing technologies, as well as investment in and increasing the value (through either increasing animal numbers or more valuable breeds) of livestock assets. Securing livestock assets, especially through improved animal health, provides incentives for further investment in livestock assets, particularly if there is good access to markets. The vision at the heart of the strategy is of market-led intensification of livestock systems that pull poor households out of poverty, but this will depend on the structure of the markets, the nature of the livestock production systems, the agroecology and potential for productivity increases, and the resource base of poor households, i.e. the economic, social, and agroecological context within which livestock systems are maintained and managed.

These three pathways therefore function essentially as a schema for organizing and articulating the research of the Center rather than as explicit impact pathways around which the Center organizes its R4D work. Projects in the past, however, were framed around these individual pathways, for example on trypanosomiasis, formal and informal milk markets, and forages. Experience suggests that these were relatively limited interventions to achieve impact on final development objectives. Instead, recent R4D projects (on which more below) are organized around more integrated approaches which link markets, productivity and assets. This reconfiguration of ILRI's R4D work has not been worked through within the Center in terms of how impact targets are specified, R4D projects are managed, and the evolving role of innovation systems as a framework for enhancing impact through partnerships. These issues will be highlighted in the report below.

*Implications of a Poverty Focus:* In the last few years ILRI has made a significant effort to internalize a poverty focus and to develop an impact culture within its research programs to achieve its overall goal. Achieving such a common vision across the Center is to be lauded. In addition it has cultivated an environment with a truly multidisciplinary approach. The review panel observed many good examples of this during its discussions with the research groups. ILRI staff recognizes the importance of paying attention to impact, whether because they want to have better research outcomes, meet donor demands, or achieve the objectives of using livestock as a pathway out of poverty. How to achieve these complex and ambitious objectives across the board is one of the issues noted during this review that still remains largely open. Further, this relatively complex mission and related operational objectives have associated with them a range of important tensions.

First, the poor because of their location, agroecology, education, and resource base are the least likely to be integrated into formal markets, relying more on local, informal markets. They are also less likely to have the land, human capital, and financial capital to access new technologies and improved management techniques. For a research organization such as ILRI whose mission is framed by development goals, there is a constant balancing between developing clearly targeted research programs and realizing development outcomes—what CIAT terms proof of delivery (Lefroy et al. 2009). The latter usually involves partnerships with development and civil society organizations that in turn often entails differences between ILRI and partners in goals, objectives and understanding of impacts. These differences become particularly stark when ILRI attempts to superimpose research objectives into the project that test how the poor might be more effectively benefited through livestock.

Second, given that the impact pathways of much of ILRI's research are through markets, the poor often do not have the surpluses to participate in markets. Addressing the constraints of the poor and achieving widespread, quick adoption is a challenge. From a quantitative impact assessment perspective this is likely to mean that the returns on research investments from the total welfare change for the poor over time may not be very high, relative to the full cost of the required research and development; in particular, nowhere near as high as if the research focus was chosen to maximize the welfare gains to all people in a country or set of countries. Here it is likely that more market oriented, innovative farmers and other members of the agricultural sector will adopt research products more quickly and more broadly.

How to balance the shorter term and larger impacts from better resourced farmers with the longer term and relatively smaller impacts from the poor adds considerable complexity to research decision making. This trade-off between higher total welfare gains to society versus (much) lower welfare gains to a target group, the poor, is an important issue. Fully understanding this trade-off requires consideration of some complex issues. An important potential role of impact assessment activities is to ensure that the debate around this issue is consistently and reliably informed.

Third, having a primary organizational objective which targets the distributional dimension of welfare changes from research rather than just the total welfare gains adds significant complexity to the decision making environment. Many of the broader economic (not just financial) impacts are often counter intuitive. This can often mean that expected positive welfare impacts can actually be negative in the longer term. Sometime this will be true even for the target group but more commonly for other groups (also often poor and consumers of livestock products although not producers) that were not the direct focus of the research. From an impact assessment perspective it is therefore crucial that ILRI uses a framework which facilitates alerting it to these possible counterintuitive negative impacts.

In several of the case study project/programs the review group considered, there is a strong possibility the above tensions-- linking the poor to markets, potentially lower total community welfare gains, and counter-intuitive negative welfare impacts-- are important, perhaps with some tendency to minimize poverty objectives within the project. These will be highlighted in more detail in the rest of the report.

## **2. Institutional Context**

### **2.1 ILRI: a Change and Changing Organization**

During the period under review, ILRI has undergone a significant revision of its research programs and organizational structure. As noted by the 2006 EPMR, "Unlike most CGIAR Centers, ILRI has been forced to radically revise its structure, mandate, approaches and self-image as a result of merger and changing external circumstances." In 2003 ILRI reorganized its research around a thematic structure, as compared to the largely disciplinary structure that existed previously. In the initial phases of this reorganization, reliance on project funding for work done in the themes introduced significant fluidity in the research that was carried out in the Center, and as a result, there has been an impetus to bring more strategic focus to what is a broad research mandate, in particular a mandate that is global, is organized around system approaches, and works across different animal species and agroecosystems.

Projects are grouped and managed within Operating Projects (OPs) and over time these have been consolidated into three OPs within each of the four themes. The research structure has evolved over this review period, as one theme was dissolved, an OP was dropped in the markets theme and PLE was reduced from 5 to 3 OPs. The fluidity and dynamics of this evolving program structure has broken down research "silos" and created substantial space for cross-theme interaction and project collaboration, as well as expansion into new research sites and areas, such as Asia, climate change and emerging diseases, to name but three. On the other



hand, what the Center has to guard against is dispersal and the loss of strategic focus, and particularly strategic orientation towards impact.

There are then two principal drivers for IA within ILRI, namely project needs and the information and methods that underlie greater strategic focus. These drivers in effect create the demand for IA within the institute, and as well explain the exceptional range of IA methods used in ILRI (See 3.1 below). By far, the bulk of IA data, methods, and analysis is done within the objectives and log frames of the research projects, and there is a wide range of approaches utilized depending on the balance of development and research objectives within the project, the particular approach to evaluation by the donor, and the background of the principal investigator. This diversity is an opportunity in that it allows exploration and testing of a wide range of evaluation and assessment approaches. At the same time it is a challenge in that it complicates cross program synthesis and information flows in the Center, and as yet has not resulted in any conclusion or recommendation of which method is best for what purpose. Probably most importantly there is as yet little in terms of a framework for how IA at the project level feeds into and informs more strategic planning at the OP and theme level.

*Organizing IA within ILR:* The restructuring in 2003 redistributed responsibility for IA across ILRI. The System Analysis and Impact Assessment unit was dissolved and elements of it incorporated into the Targeting and Innovation (TG) Theme. As the TG research program evolved, it assumed principal responsibility for the ex-ante impact assessment (eaIA) work, and principally within the framework of understanding drivers of system intensification and resultant targeting of research effort. Monitoring and evaluation was essentially devolved to the project level, and ex-post impact assessment (epIA) had no particular locus within ILRI until the formation of the ILRI Impact Assessment Task Force in 2007 and the assignment of responsibility for coordination of epIA to Innovation Works. Overall responsibility for IA within ILRI still remains relatively diffuse, with overall demand for IA within the institute very much focused on eaIA and M&E/M&L and external demand very much centered on epIA, especially as reflected in requirements from the Science Council and SPIA and as reflected in the 2006 EPMP recommendation charging the research themes to increase the number of epIA's. This split between internal demand for IA as a "learning" tool and external demand for IA for accountability is not unusual. The review team found little internal demand for epIA, but theme directors did recognize the need for devoting some resources to periodic epIA studies. However, without epIA how is ILRI to be accountable for the investment in its research? Are achieving indicator milestones within project funding periods sufficient, as the logic of restricted core funding might suggest? Accountability will continue to be an issue for ILRI—as it is for the CGIAR as a whole—and the review comes back to this issue below.

Innovation Works is itself something of an institutional innovation within ILRI, as organizationally it operates across the four themes. Its role was initially relatively loosely defined, with its activities and strategy becoming more tightly focused over time. Innovation Works currently focuses on three principal functions. Firstly, it serves as an incubator of new research areas. Secondly, it develops new tools to facilitate project planning, design and implementation with partners. Finally, it has been leading a Center-wide process to clarify strategic objectives within the OP's and themes and particularly to map how OP outputs are translated into development outcomes. This outcome mapping forces a specification of the principal strategic

research objectives within the OP's and themes. This process is a key part of the strategic "tightening" across research activities within the Center. This is an important process at this stage for ILRI but with some lack of clarity on what the end product will be. Particularly, there is an important drive to get greater coherence across OP's within a theme. However, it is not clear at this stage how theme outcomes across ILRI define and contribute to strategic objectives for the Center as a whole and in turn how these would map into outcome targets for ILRI—ie a preliminary results framework for the Center. The review will come back more explicitly to the issue of translating research outputs into development outcomes.

## 2.2 Why this CCER?

Given the diverse roles played by IA in ILRI, the changes in how IA is planned and coordinated, and its role in developing an "impact culture" within the Center, a CCER was commissioned by ILRI management and approved by the board. The central objective of this review is "to assess the role within ILRI of impact analysis for both demonstrating impact and *achieving* greater impact."

The team is asked to look and provide recommendations to ILRI around 3 questions:

1. *How are we measuring and monitoring our impact?*
2. *Are we learning from impact monitoring and applying lessons in the design and implementation of projects?*
3. *How is impact assessment organized within ILRI, and when and how should we outsource impact assessment?*

Recall that IA can serve two purposes: accountability and learning. Demonstrating and measuring impact to a large extent encompasses the accountability role, but if the focus is on learning, then understanding cause and effect in how impact is attained necessitates building a research component into the design of a program or project. Such research feeds into how ILRI positions itself to achieve greater impact. However, achieving greater impact can also come from better ex-ante IA feeding into strategy development, program focus, and integration across research program activities. Thus, IA for the purposes of learning can occur along the entire continuum, from conception through to ePIA. Such an integrated IA process (or results framework), however, requires consistent application across Center themes and OP's. Such capacities are located in different themes or units across the Center and different components of an integrated approach are applied to some research programs or projects and not others. "Learning" from IA within ILRI currently takes place essentially at the project level.

*Achieving Development Outcomes:* How then does ILRI think about how it achieves impact? The review team found considerable difference in views within the Center on this question. These may be summarized into three modes of operation, as follows:

1. Assemble a critical mass of projects (or a very large, long-term project that serves as something of a platform) on the ground in a target region (e.g. West Africa or South Asia), establish the partnerships, the understanding of systems and institutions, and ILRI credibility, and evolve the project portfolio toward more strategic impact targets over time. This approach particularly applies to regional programs and good examples are the application of

experience in smallholder dairy in South Asia and the large project on indigenous animal breeds in West Africa. This tact is partially strategic and partly opportunistic, with the latter due to the reliance on project funding.

2. Establish clear targets and strategies and then design a research program, projects, and support capacities in order to achieve those targets. This strategic planning approach is less used in ILRI at the moment, partly due to the evolving institutional structures within ILRI and again partly due to the reliance on project funding for undertaking the research agenda.
3. As a research institution, produce knowledge products, research methods, research products, and pilot research that feed through enhanced partnership capacity, innovation systems, and impact pathways. This approach is best reflected in the work on innovation systems, particularly that within forage projects. This strategy shifts the responsibility for achieving development outcomes to national innovation systems, and is quite distinct from assessing development outcomes in the frame of large-scale R4D projects.

Each of these strategies implies quite different IA approaches and methods. The *first* relies on an effective baseline and monitoring system within the projects supplemented by more systematic knowledge on livestock systems, markets, and constraints. The *second* is organized around a more systematic ex-ante process, development of well specified targets, and a hierarchical development of Center, theme and OP strategies. The *third* is organized around better understanding of how impacts are achieved and enhanced specification of downstream impact pathways closely linked to capacity strengthening and communication programs. These modalities are not mutually exclusive and as might be expected given the recent restructuring within ILRI, elements of all three are found in the Center. Significantly less of the second approach is found currently, although with more recent efforts being given to enhancing this modality through the Targeting group.

ILRI's intent through this CCER to better systematize IA within the Center comes when there is a widening discussion across the CGIAR on broadening IA beyond a purely accountability function and much more for utilitarian or instrumental purposes (see, e.g., Horton and MacKay 2008; SPIA 2008; SPIA 2009). Much of this discussion focuses on the "learning" function of IA and its close association with the expanding field of evaluation. Three principal and related distinctions are at the core of this debate. First is the distinction between practicality, namely the cost and effective utilization of the evaluation in decision making within the Center, and research rigor, where the results of IA can potentially be generalized and contribute to the literature. This has generally been a comparison between mixed methods and eplA, although the latter can be extended to include experimental approaches and ealA. Second is the difference between assessing outcomes (or results) and understanding the process by which those results were or were not achieved. This distinguishes theory failure from implementation failure, and becomes particularly important when evaluating "proof of delivery" and points of failure along an impact pathway. Third, and closely related to the last point, is the difference between assessing impact on farm productivity and that on organizations, capacity, and policy, where economic evaluation has been very successful in the former and has had difficulty in the latter, opening the possibility for other types of evaluation methods. As a research institution, ILRI has put more emphasis on the more rigorous, economic approaches and less on the more management oriented,

evaluation approaches. However, the CGIAR change process is shifting that balance to more evaluation approaches and ILRI needs to assess the relative utility of both in its research planning and decision making.

### **3. Current Status of IA in ILRI**

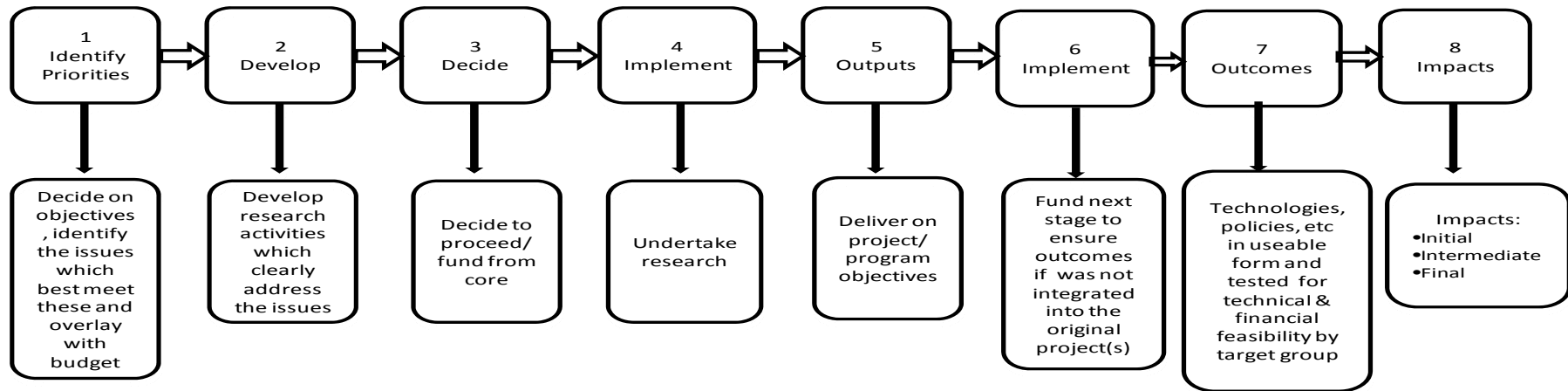
Most of the research undertaken by ILRI is done outside the laboratory or experimental station and within a development context, that is, in the field under uncontrolled conditions and within the purview of existing livestock systems, market conditions and institutions. This *modus operandi* reflects in part the nature of the research on livestock systems within Africa or South Asia and in part the opportunities for funding, as most comes from development rather than scientific budgets. Impact assessment in turn becomes an integral part of the research process and is difficult to separate from analytical methods employed in field-based research. As such, impact assessment within ILRI has a large social science component tightly aligned with biological, epidemiological or ecological field methods. However, the research orientation of much of the basic data collection and evaluation should not crowd out the role that IA plays in decision making within the project, operating program, or overall management of the Center. This section develops a framework to evaluate impact assessment methods as employed within ILRI and then reviews the application of those methods within particular projects carried out by the Center.

#### **3.1 Framing IA within ILRI: Matching Approaches/Methods to Stages in ILRI's Decision Making**

The utility of IA is a function of the decision making which it supports. For agricultural research a simplified schema of the decision making process can be illustrated by an 8 stage project or program planning cycle or research to impact pathway as illustrated in Figure 1. This cycle distinguishes between a planning or priority setting phase (stages 1-3), a project or program implementation phase that produces research outputs (stages 4-5), a subsequent design phase on how outputs are best delivered to achieve appropriate outcomes -the 'proof of delivery' (stage 6), another implementation phase to evaluate development outcomes (stage 7), and a final impact phase after a lagged period of diffusion of the innovation (stage 8).

The impact phase has three components which increase in complexity as the adoption of the research outcomes works its way through the complex of economic, environmental and social systems. In designing impact assessment systems to support this decision making it is important to have a full understanding of the impacts through to this final stage. It is only at this point that all the implications can be fully understood. Often some of these are counter intuitive, particularly with respect to the distributional consequences of the final welfare change. There are usually always gainers but also some losers. Depending on the objectives of research organizations these may or may not be of major importance. Impact assessment approaches/methods to support this decision making cycle are numerous and can be applicable at one or in some cases all of the 8 stages.





**Figure 1: Research Project or Program Planning Cycle – Research to Impact Pathway**

Table 1 provides a list of all of the impact assessment approaches/methods which the review team found during the review period that have been, are being or are planned to be used by ILRI. The table also indicates at which stage in the research cycle the approach/method can be used to support decision making. We also found it useful to group the approaches/methods by the level or type of decision making they can be used to support. The groupings were for accountability, priority setting/strategic planning and learning/improved project design and implementation.

As is seen some approaches/methods can be used for a range of stages and/or types of decision making, while others are more specific.

Table 2 provides a summary of which stages in the research cycle and when ILRI have used the various approaches/methods. It can be seen that many have been relatively recent and very few have been used for more than a few years. More details of these experiences are discussed in the rest of this section

**Table 1: Summary of Stage in the Research Cycle and Types of Decision Making Impact Assessment Approaches/Methods can be used to Support**

Impact Assessment Approach/Method	Ex ante or Ex post	Identify Priority Areas	Development	Decide	Implement Project	Outputs	Implement outcomes	Outcomes	Impacts - Initial	Impacts - Intermediate	Impacts - Final
<b>Accountability</b>											
Outcome statements	Ex post							**	***		
Adoption studies	Ex post								***	*	
Simple Impact Index	Ex post						*	**	***		
<b>Priority Setting</b>											
Spatial analysis	Ex ante	***	*	*	*				*	*	
Scoring model priority setting	Ex ante	***									
<b>Learning</b>											
Innovation Systems	Ex ante	*	***	*	**		***		*		
Impact pathways	Ex ante	*	***	*	**	*	***	*	*		
Challenge dialogue	Ex ante	**	***	*	**	*	*	*	*		
Outcome mapping	Ex ante		***	*	**	*	*	*	*		
Monitoring & Learning	Ex ante				***	**	***	*			
Partnerships	Ex ante	**	***	*	**	*	*	*			
Integrated Livestock Development Project	Ex ante	*	***	*	***	*	*	*	*		
<b>Learning/Accountability</b>											
Monitoring & Evaluation	Ex ante				***	***	***	*			
<b>Accountability/Learning/Priority Setting</b>											
Applied Welfare Economics (Econ Surplus)	Ex post/ Ex ante	***	**	**	*		***	**	***	***	***
Experimental Methods	Ex post/ Ex ante				***	**	***	**	***	**	*
Systems modeling	Ex post/ Ex ante	**	*	*	**	**	**	**	***	**	*

Note \* denotes mildly applicable while \*\*\* denotes strongly applicable. Importantly there are very few approaches/methods which can systematically identify and measure the full final impacts of research



**Table 2: Summary of ILRI Use/Application of Impact Assessment Approaches/Methods to Support Decision Making**

Impact Assessment Approach/Method	Ex ante or Ex post	Identify Priority Areas	Development	Decide	Implement Project	Outputs	Implement outcomes	Outcomes	Impacts - Initial	Impacts - Intermediate	Impacts - Final
<b>Accountability</b>											
Outcome statements	Ex post							Just Started	Just Started		
Adoption studies	Ex post							Used 1990's to 2005	Used 1990's to 2005	Some input to ES	
Simple Impact Index	Ex post						About to start	About to start	About to start		
<b>Priority Setting</b>											
Spatial analysis	Ex ante	Since 2003							Could be useful support		
Scoring model priority setting	Ex ante	Used 2000-02									
<b>Learning</b>											
Innovation Systems	Ex ante	Recent last 1-2 yrs	Recent last 1-2 yrs		Recent last 1-2 yrs		Recent last 1-2 yrs				
Impact pathways	Ex ante	Last 5 yrs	Last 5 yrs		Last 5 yrs		Last 5 yrs				
Challenge dialogue	Ex ante	Just started	Just started		Just started	Just started	Just started				
Outcome mapping	Ex ante		Last 3 yrs		Last 3 yrs	Last 3 yrs	Last 3 yrs				
Monitoring & Learning	Ex ante	Last 8yrs	Last 8yrs		Last 8yrs						
Partnerships	Ex ante	Last 5 yrs	Last 5 yrs		Last 5 yrs	Last 5 yrs					
Integrated Livestock Development Project	Ex ante										
<b>Learning/Accountability</b>											
Monitoring & Evaluation	Ex ante				Various forms for 10yrs +	Various forms for 10yrs +	Various forms for 10yrs +				
<b>Accountability/Learning/Priority Setting</b>											
Applied Welfare Economics (E Surplus)	Ex post/ Ex ante	Some 1998-2003	Some 1998-2003		Some 1998-2003		Some 1998-2003		Some 1998 - 2003 & last 2yrs	Some 1998 - 2003 & last 2yrs	Some 1998 - 2003 & last 2yrs
Experimental Methods	Ex post/ Ex ante				About to be used		About to be used	About to be used	About to be used	About to be used	
Systems modeling	Ex post/ Ex ante	Some since 2000	Some since 2000		Some since 2000		Some since 2000		Some since 2000	Some since 2000	

### 3.2 Accountability and Organizational Learning

Within the CGIAR system there is a relatively polarized debate that revolves around the balance of impact assessment methods and resources that should be devoted to accountability functions versus organizational learning functions. The two poles within the debate exist primarily because SPIA has defined ePIA as virtually the sole basis for accountability within the CGIAR. However, ePIA can be a very useful source of organizational learning—and this term is not often clearly specified—and other methods can be used to fulfill the accountability function, depending on whom and for what purpose. In particular, many Centers argue that ePIA studies are relatively costly and primarily funded from scarce core resources, and that given the time lags they provide both limited utility for decision making by either the Center themselves or the donors investing in the research (Raitzer and Winkel 2005). The argument is that these resources, which tend to be highly constrained, could be better spent on IA that feeds into critical decision points within planning and resource allocation within the Centers. This debate was highlighted again at the last IAFP meeting, noting that “the demand for the study (on enhancing the use of ePIA in the CGIAR) derives from an increasing emphasis given to learning for decision making and priority setting from all forms of evaluation, of which ePIA is one. SPIA maintains that learning should not come at the expense of de-emphasizing accountability.” (SPIA, 2008) The alternative viewpoint is expressed by Patton (2008) as follows: “A great deal of evaluation continues to be compliance activity – mere paperwork procedures -- done to meet accountability mandates rather than to seriously support learning and decision-making.” The review team notes that these two contrasting viewpoints are expressed within ILRI, but also notes that there is a higher degree of complementarity between methods and functions than is often expressed in these debates.

#### *Characterizing the Accountability Function*

Accountability encompasses a range of responsibilities between a range of different actors, and these will be explored briefly following Koppell (2005). He argues that organizations face a number of dimensions of accountability that are often conflicting, leading to what he terms multiple accountabilities disorder (MAD). These are outlined in the following table, tailored to ILRI’s characteristics:

**Table 3: Conceptions of Accountability**

Conception of Accountability	Key determination
Transparency	Does ILRI reveal the facts of its performance?
Liability	Does ILRI face consequences for its performance?
Controllability	Does ILRI do what the principal (e.g., the donor) desires?
Responsibility	Does ILRI pursue its mission and act internally on pro-poor norms?
Responsiveness	Does ILRI fulfill the substantive expectation (demand/need) of NARI's or farmers?

ILRI is an independent organization where transparency and liability are not principal issues. Controllability is exerted through access to funding, either directly in terms of project agreements with donors or indirectly through the Science Council and its potential influence on principally core funding. In many respects controllability is the principal accountability dimension, but ILRI is also responsible to its research partners and its role in influencing the global livestock research agenda. Finally, in order to achieve impact, ILRI needs to be responsive to the needs of its principal clients, namely livestock keepers in the tropics. To be responsible and responsive ILRI relies on more ealA and the learning coming from its ongoing project portfolio. Even in terms of controllability, direct project investors are interested more in the direct outcomes during the project period and the learning associated with them. The accountability function served by eplA is therefore primarily in terms of apparent demand from System-wide donors. However, as USAID notes (SPIA, 2008), “results achieved in the past (via eplA studies on rice, wheat, cassava) have been valuable in keeping a focus on agricultural research within the overall development portfolio”, but are not that important in the allocation of funds by USAID within the System.

The above is very compatible with the definition of accountability as the processes through which an organization makes a commitment to respond to and balance the needs of stakeholders in its decision-making processes and activities, and delivers against this commitment (Lloyd et al., 2007). If viewed in the frame of multiple stakeholders and multiple dimensions of accountability, then ILRI is moving toward a merging of accountability and learning in terms of how it designs its IA and who uses the results for more informed decision making.

### **3.2.1 The Methods and Metrics of Accountability**

The movement to a results framework by both the Independent Review of the CGIAR (2008) and the CGIAR reform process has broadened the accountability metric beyond mere reliance on eplA. The time lags inherent in a research product diffusing and achieving widespread impact, the uncertainties inherent in delivery systems, and the mismatch between current research investment in Centers and the profile of existing or potential eplA studies has resulted in a perceived gap in the accountability metric and the need for more “real time” monitoring of research investment. In Figure 1 this shifts the methods and metrics back to those that evaluate how outputs are translated into development outcomes—and thus in some correspondence as well with the learning function. As noted above, ILRI is currently in a relatively formative process of assessing exactly how to do this and in part challenged by the advent of large, regional livestock development projects (which will be discussed in detail below).

What would a results framework look like for ILRI and would it be of value? Table 4, taken from the Independent Review of the CGIAR provides some reference points, with the Theme/OP structure of ILRI being analogous to the comments on the CGIAR/Centers. A column on “What ILRI does” might include the following:

- livestock research mandate set within broad development goals but no clear strategic targets attached to those goals;
- management is attempting to achieve more strategic coherence within the theme and OP structure—although difficult with the dependence on projects;

- as reflected in ILRI's six outcomes submitted to the Science Council, performance does focus on research outputs but at the same time there is an expanding R4D project portfolio together with work on innovation systems, and
- no mistrust between management and programs but also no performance evaluation framework at theme or OP level. In sum, ILRI would find it difficult to move quickly to a results framework applied at a Center-level, but this partly reflects the continuing consolidation after the restructuring and the difficulty of doing this with increasing dependence on restricted core funding.

**Table 4: Differences between the CGIAR and managing for results**

What managing for results involves	What CGIAR does
Results-oriented strategy sets strategic directions and defines desired outcomes of Centers and programs relative to the mission and strategic objective indicators	Competency-oriented strategy, not prioritizing research for results.
Management decisions and resources aligned with strategic objectives	There is no management system: independent Centers are not working together or effectively with CGIAR and its coordinating bodies
Program performance targets clients/partners and client/partner's beneficiaries quality of life improvements	Program performance targets outputs and is unclear about international public goods "core" and "complementary" roles
Indicators used to direct resources to most effective results, motivate staff, and improve service.	Mistrust between System and Centers relates to indicators and evaluation and leads to poor cooperation.

Source: Independent Review Panel.

Looking forward, ILRI is moving toward defining (if not, quantifying) at Center-level three principal strategic objectives around which it could identify impact targets and which could map onto a results framework. These are (1) enhanced productivity of livestock production systems, (2) reducing rural poverty in areas highly dependent on livestock, and (3) sustainable management of the rangelands (and its water resources). Two points might be stressed at this juncture. Firstly, there is at yet no clear articulation of theme and OP outcome strategies and how they would map into achieving potential targets across the three strategic objectives. Innovation Works is at an early stage of defining outcomes at the theme and OP level but how these would map into achieving strategic objectives at the Center level is largely still open, much less framing these in terms of quantifiable targets. Secondly, there are no clear metrics that can be attached to these three strategic objectives, possibly apart from the poverty objective. Measuring productivity of livestock systems, i.e, some ratio of (partial) inputs to outputs, is extraordinarily complex, particularly within the mixed systems that are the target of much of ILRI's work and given the multiple outputs produced within livestock systems. It is probably fair to say that a few simple indicators, as suggested by the Independent Review Panel, would not suffice. Yet how does ILRI think about establishing a baseline on current productivity and measuring progress toward improving productivity? The same issues apply to the sustainability of rangeland management. As the impact or performance analysis

moves back from the rates of return in ePIA to a complex of intermediate performance measures, issues of comparability and reliability come to the fore. The review team posits that ILRI has not been systematic in sorting through these issues, much less applying them consistently in its work. The review returns to this issue below in the section on data.

However, to bring this section full circle, any movement toward systematic performance monitoring in relation to strategic targets does not substitute for the final reconciliation of program impact that comes from a well executed ePIA. The ePIA provides an assessment of all the assumptions that went into the program development and its implementation, as well as the unintended consequences. It provides an estimate of program impacts that can be compared with other lines of investment, and if not a gauge of future investment, a central part of the learning process.

### **3.2.2. The Methods and Metrics of Accountability**

As impact assessment moves from a final reconciliation to performance monitoring in achieving impact, there is the danger that research and development programs become straitjacketed to predefined targets. The IA system has to retain the potential for continuing assessment and learning leading to possible adaptive adjustment. ILRI's research programs have shown particular flexibility in this regard. In a research to policy example, the Smallholder Dairy Project evolved over time from a research focus on smallholder dairy farmers' production and public health concerns into a research to policy project. The project had three phases: (1) dairy research and development in Kenya, (2) delivering of technologies, and (3) a deliberate focus on impact through risk management in informal markets, especially at the policy levels. The solid base of dairy research evidence gathered over almost a decade was instrumental in having a significant impact on behavioral change of producers, government, the private dairy sector, CSOs, and donors (Leksmono et al. 2006).

As an example of ILRI operating as a learning organization and using learning outcomes to measure impact, the project on building capacity of African veterinarian partners to diagnose and respond to avian flu was started in 2007 with a two-pronged approach. The first approach was to improve basic and advanced field and laboratory techniques for the diagnosis of avian flu. This included hands-on training covering bio-security and bio-containment, necropsy, sample collection, packaging and shipping, serological diagnosis and initiation to virology and molecular diagnosis using inactivated AI virus. The second approach was to provide capacity development in risk-based assessment approaches (including risk mapping), participatory surveillance and rapid reporting in selected countries and at regional level in eastern and western Africa. Training was combined with analysis of actual field data to assess and provide recommendations on reducing avian flu risk. Outcomes at the national level are linked to the better coordination capacity of the African Union's Inter-African Bureau of Animal Resources (AU-IBAR) to support country risk mitigation efforts in collaboration with FAO and OIE. Evidence is provided on trainings, documents, and testimonials.

An example of the search for impact in terms of return on investment (ROI) occurred in several of the large vaccine projects, some of which lasted for years, most of

which did not produce a commercially viable vaccine and therefore might have been considered to be failures. However, the evaluators neglected to take note of all the intermediate products and diagnostic tools for which the researchers did not get credit and which have had considerable impact on vaccine development in general (Thornton, 2009, personal communication).

To a significant extent what these examples represent are adaptive change at the OP level, although still framed within ILRI's Center-wide strategic objectives. The learning coming from a range of monitoring and evaluation (M&E) methods supported programmatic change and adjustment and such features are crucial to a research institution that progressively builds on an ever expanding knowledge base. For many development partners and for many donors this would be sufficient. However, the *quid pro quo* in moving to higher levels of unrestricted funding is that such successful programs in turn can be shown to lead to impact on theme outcomes or more directly to impacts on ILRI's strategic objectives. This will be a matter of the research priority set on which ILRI works, as well as the approach to achieving development outcomes, what was referred to above as the three modalities that ILRI uses to achieve impact.

### 3.3. Tensions

As the examples above suggest, impact assessment in its more general sense provides the information and analysis that supports research and project decision making in attaining impact objectives. As with the overall field of evaluation, impact assessment methods within ILRI range widely partly depending on the project and partly driven by the desire to explore new methods. However, the trend within ILRI toward more strategic planning at the theme and OP level, the integration of research components in support of development outcomes (often within R4D projects), more effective knowledge management within the Center, and some systemization across the Center in areas such as impact assessment does create some natural tensions in how all of this moves forward and how impact assessment should be managed. It is useful to identify some of these tensions across what might be termed the practice of impact assessment within ILRI.

- ***Alternative Theories of Change in Achieving Impact***

Innovation systems and integrated livestock development projects (potentially supported by experimentation through RCTs) encompass two quite different approaches to a theory of change underlying agricultural development. This is best articulated as follows by Patton (2008) in a very stark contrast which over-simplifies but brings out the point:

- One theory of change involves high fidelity dissemination of best practices -- a top-down approach that involves identifying effective practices and technologies and disseminating them around the world. RCTs are part of that model where you're attempting to find generalizable recipes that can be used for development effectiveness in different places. Find what works and take it to the world. The alternative theory of change approach to development is a bottom up, adaptive management approach that involves taking promising ideas and adapting them to fit the local

situation, working collaboratively with people at the local level through participatory processes.

ILRI currently is experimenting with both approaches in how to achieve impacts through its research, partnership, and development activities. However, there is an underlying question of which is most effective, particularly within an African or South Asian context, and which should therefore be the principal vehicle for attaining future impact. In ILRI this is reflected in a very interesting divide between staff as to whether the Center is primarily a research institution or a development institution. The Science Council probably favors the scaling-up theory of change, at least in terms of its approach to the African Challenge Program which was first designed as very much a bottom-up program but where the Science Council wants to see a rigorous test of proof of concept of the approach and its potential scaling out. For a global research and development center such as ILRI this tension will probably never be resolved.

- ***Rigor vs. Appropriateness of Evaluation Methods***

The alternative theories of change spill over into the approach to IA, and the tensions become particularly stark in a research organization such as ILRI where the focus is on producing international public goods. The dichotomy is often framed between research and organizational learning, between rigor from quantitative methods and appropriateness from mixed methods, and between hypothesis testing and building capacity for innovation. These tensions are particularly reflected in the application of monitoring and evaluation methods within a research mode versus a monitoring and learning approach within a more action research/process mode. ILRI to a certain extent has institutionalized both approaches in the work of TI03 on innovation systems and the more formal approaches of the research methods group. At issue is whether there are different spheres of application of the two approaches and where are there real trade-offs and/or complementarities between the two.

- ***Economics vs. Other Disciplines/Methods***

Agricultural economists form the bulk of social scientists within ILRI. Economists, as compared to other social scientists and to the evaluation profession in general, tend to be more quantitative, more product than process oriented, and more reliant on theory to guide field research. Moreover, the early work on impact assessment of agricultural research was primarily done by agricultural economists working within the tradition of economic welfare theory or economic surplus methodologies. SPIA very much reflects that tradition in assessing impact, to a large extent to the exclusion of other IA approaches, and where the gold standard for IA is framed in terms of rates of return measured within an economic surplus framework—see the *Strategic Guidance for Ex Post Impact Assessment of Agricultural Research* (Science Council, 2008). Reliance just on economists working within this gold standard for impact assessment, creates tensions in terms of how IA is mainstreamed across the projects within ILRI, how the IA work within innovation systems is assessed, and how IA at ILRI is shared with the larger livestock research community.

- ***Multiple Impact Objectives***

In partnerships and systemic interventions the sum is often different from what one would assume from the assemblage of the parts. Conventional tools enable easy measuring of impact of a single objective such as economic return on investments or productivity enhancement. Systems analysis suggests that the combination of factors require the need to look at several impacts, often in combination, and differential impact on different groups – very poor, women etc. How projects report on these different kinds of impacts is a challenge. Further, how does ILRI look at the issue of attribution in partnerships? Should it instead focus on contribution? How much of impact is due to its own, or project's own intervention and how much due to changes in the broader environment in which the project operates? Negating the latter can boost the contribution, in favorable environments and reduce the contribution in disabling environments. How does ILRI look at multiple objectives in measurement?

- ***The Relative Costs and Benefits of Data Generation***

The effective assessment of impact relies on appropriate data generation, use often by staff that did not generate the data and some level of consistency and comparability. ILRI is continually engaged in generating a large amount of both quantitative and qualitative data across its various projects. Should ILRI seek to achieve some comparability across similar types of data sets and develop guidelines for data generation and standards or should it let its projects continue to maintain diversity of data types depending on project objectives? Moreover, there is a basic tension (often over cost) between performance indicators that are principally used for project management and data needed to understand change in complex livestock production systems that is critical for some areas and methods of impact assessment.

### **3.4. Ex-Ante Impact Assessment, Priority Setting and Targeting**

As ILRI moves to putting more emphasis on strategic planning within its research programs, increasing focus is being put on ex-ante impact assessment techniques. These have some history within ILRI. Within the former Systems Analysis and Impact Assessment Unit, a global priority setting exercise was carried out in 2001, prior to the restructuring (Randolph et al. 2001). The priority setting was organized around the seven former program areas of ILRI, and assessed 26 possible thematic areas across a range of impact objectives. The study was of good quality and helped to inform the restructuring process, but was not central to it. Part of this was due to the significant generality in the research themes, and part due to the restructuring based on first principles. However, the ex-ante impact assessment during that period also included a number of very good studies that were much narrower in terms of the research options analyzed, such as maize for food and feed in Southern Africa and dual purpose cowpeas in West Africa (see Table 5).

Nevertheless, these as well were not effectively incorporated into research planning at the time, partly because they were too narrow for the restructuring taking place and partly because each area lost its organizational home during the restructuring.



An appropriate middle ground was not found during the restructuring process, and possibly as a result ex-ante priority setting within an economic surplus framework was effectively dropped from the repertoire of IA methods, at least through this review period.

As a result of the restructuring, the responsibility for ex-ante IA was taken on by the Targeting and Innovation (TI) theme and the ex-ante work built on the systems modeling component within the former unit. The focus of this work was on understanding how livestock systems were changing, particularly as a result of the increasing demand for animal products in developing countries, in what has come to be known as the livestock revolution. In the former system analysis unit there had been significant work on development of household level models of mixed crop-livestock systems, termed IMPACT. As noted in Herrero (2007), "IMPACT is thus not only a data interface and database; it also offers the user a first step towards the understanding of the systems functioning (through a set of analytical tools and as a platform for linking to other simulation models)." Neither the database nor the modeling platform were utilized within either the Markets or PLE themes, as they were viewed to be too data intensive. Partly as a result, continued work on household decision-making models was discontinued in 2007, in order to focus much more on the modeling at the macro level.

**Table 5: Summary of ILRI ex Ante Impact Assessment (exIA) Studies**

Year of Study	Brief Title	Publication	Research Area	Type of Study	Methodology	NPV	IRR	B:C
1997	ILRI's Feed Research	IAS WP No 97/1	Animal Feed	exIA Stage I	ES	137	17-44	55
1997	Resistance to helminthiasis	IAS WP No 97/1	Pests	exIA Stage I	ES	52	42	29
1997	Small Holder Dairy Technology	IAS WP No 97/2	Farmer Practices	exIA Stage I	ES	20	25	ne
1999	Enhanced sorghum millet residue	IAS No 3	Animal Feed/ Plant Im	exIA Stage I	ES	42	28	15
1999	Trypanosomiasis vaccine research	IAS No 4	Disease	exIA Stage I	ES	288	33	43
2002	Maize Food/Feed Fert	IAS No 11	Plant Im/Farmer Practices	exIA Stage I	ES	245 to - 112	ne	27 to <1
2002	Dual Purpose Cowpea Improvement	IAS No 9	Plant Im/Farmer Practices	exIA Stage I	ES	606.4	71	63.2
2002	Valuing alternative land uses patterns for wildlife areas	ILRI IAS No 10	Biodiversity	exIA Stage II Part	Survey	na	na	na

Much of ex-ante priority setting within ILRI is framed around understanding livestock system dynamics in different regions, primarily as a result of market drivers and more recently climate change scenarios. The macro targeting work combines modeling of animal product and input markets with spatial analysis of poverty, resource constraints, and competition for feed resources, which in turn defines scenarios of livestock system intensification. Logical extensions to this work have included water and most recently climate change. This combination of trends in livestock system evolution and the spatial identification of intensification "hotspots"

and areas of social and economic vulnerability of households has been very useful in framing policy scenarios in the future for the livestock sector in joint work with organizations such as FAO, the CGIAR Challenge Program on Water and Food, the System-wide Livestock Program, ASARECA, FARA, SADC, IFAD, and DFID. The leverage on the global livestock research agenda that ILRI has achieved through this work has been important in placing ILRI at the center of many important policy debates on livestock. On the other hand, the macro work has been less utilized within ILRI research programs themselves, and there is a growing latent demand within the Center for more targeted ex-ante work.

Looking forward into the short and medium term, there are two sources of demand for more ex-ante work within ILRI. The first is in terms of support to project design and implementation. Currently the principal input into projects is in terms of the spatial mapping, particularly the use of poverty mapping for site selection. There is little formal ex-ante IA that supports project planning, where there could be a potential role in evidence-based dialogue with donors and partners. However, the targeting work most importantly defines the market, system, and agroecological context within which projects are implemented, and these could both define control variables for paired comparison or site selection. As importantly, the projects farm and household monitoring could provide the ground truthing for the macro modeling, which in turn could be supported by the IMPACT modeling. One further step could be linkage between the macro and micro modeling as suggested in the 2008-10 MTP: “The 2006 CCER on Spatial Analysis and Systems Modeling noted the need to integrate global and regional analysis (macro level) with household analysis (micro level) to strengthen the contribution of this research to setting livestock research and development agendas. In response, steps have been taken to strengthen capacity in household level analysis with a view to enhancing the macro-micro linkages.” To do this effectively would require aligning the farm-level monitoring at project level with the IMPACT model, with the result that sources of productivity growth could be partitioned and alternative intensification pathways could be explored across feeds, genetics, and disease control.

The other area where there is emerging demand for ex-ante IA work is in support to OP strategy development. Many OP's have priorities developed on the basis of relative importance. For animal diseases and vaccines and pathogens causing food safety issues on meat there is some assessment of distribution and perceived severity. However, there are a range of strategic issues that are at the heart of OP strategies. For example, what are the tradeoffs between in-situ genetic resource conservation and improved animal productivity from breeding? For trypanosomiasis, there are questions about investment choices across reducing drug resistance, transgenics, vegetation and ecosystem management, and vaccines. More systematic ex-ante IA could significantly aid in strategy development, but at the same time this work needs to respond to clear demand for such work in order to avoid the previous situation of investing significant resources in such work but with limited use by research programs.

### **3.5. Assessing Impact through Project-Based M&E**

The implementation of the “proof of delivery” within ILRI is done within three very different methodological frameworks, with the projects under review distributed across these three frameworks as described in the following table.

**Table 6: A Framework for Characterizing R4D Projects**

Methodological Framework	Projects
Innovation Systems	Forage Innovation and Extension Projects (FIP and FAP)
Experimental Evaluation Methods	Index-Based Insurance (IBLI)
Integrated Livestock Development Projects	East Africa Dairy Development (EADD) Sustainable Management of Globally Significant Endemic Ruminant Livestock in West Africa (PROGEBE)

Each of these methodologies is relatively new within ILRI, each has particular implications for the choice of IA methods, and each focuses on the evaluation of development outcomes. These projects largely frame possible future directions for both ILRI research and its approach to achieving greater impact. As such, they also lie between program planning within an ealA mode and impact evaluation within an eplA modality.

It is useful at this stage to briefly characterize the three approaches. Innovation systems focus on building capacity for innovation in downstream delivery systems. The approach assumes a flow of technical innovations which can be adapted and integrated into local production and market systems, often through organizational innovations. This is usually done within a value chain framework through platforms of principal actors in the supply chain. Innovations system approaches are seen as a mechanism for downstream innovation and for scaling up, although the latter has yet to be fully tested. The IPMS project in Ethiopia is implemented in an innovation system framework.

Experimental approaches to evaluating development interventions through randomized controlled trials (RCTs) have gained currency in the development field, especially in the health and education sectors. The World Bank has particularly promoted these approaches in the evaluation of development assistance but at the same time there are a wide range of very prominent critics of the approach (see Deaton 2009; Jones 2009). As Patton (2008) has pointed out, “RCTs work for narrowly defined, well-controlled and controllable, high fidelity, and standardized interventions. They do not work well for complex, multi-dimensional interventions in dynamic environments.” Thus, in ILRI Grace et al. (2008) used the approach to “evaluate the impact of providing information on the diagnosis and treatment of bovine trypanosomiasis by farmers” and a similar design is being used in the work on index-based insurance for pastoralists.

Livestock development projects have had a very poor record in sub-Saharan Africa, although primarily in the period before structural adjustment and market liberalization. ILRI in the last two years has been involved in the implementation of two large, multi-country, integrated livestock development projects in East and West Africa respectively. These projects in part provide an unrivaled platform for evaluating and testing alternative pathways out of poverty through livestock interventions but at the same time probe ILRI’s role in such projects and the

compatibility between ILRI's research objectives and the development objectives of implementing partner institutions.

The four projects under review cut across the four program themes, focus on understanding how to generate development outcomes, and are implemented with very different methodologies, as summarized in Table 1 above. Such projects form the context within which most M&E is done within ILRI, and the intent in this section is to compare how M&E and IA is made operational across the three approaches in relation first to project objectives and second to organizational learning at a theme or Center level. As noted by Puskur et al. (2009) for the forage projects, "the design of the projects employ Innovation Systems as the organizing principle, and allow implementation of an effective development project blended with rigorous scientific research." How a research framework is overlaid on the implementation of a development project influences both the M&E design and the type of conclusions that can be drawn from the research.

Puskur et al. (2009) suggest four challenges that underlie such research, namely:

- translating research outputs to developmental outcomes (as outcomes are what is being evaluated);
- addressing diversity in innovation system and livestock systems contexts
- how more generalizable results can be generated from location-specific research
- how to do achieve impact at larger scales

The fundamental difference between an innovation systems approach as used in the forage work and the approach being pursued in the East Africa Dairy Development project (EADD) is how and when research outputs are identified and a delivery pathway defined. In EADD the analytical assessment is done prior to project implementation and forms a fundamental part of project design. However, for the forage work the central focus is on building capacity within the livestock innovation system to assess constraints and to innovate around those constraints with no particular interventions prescribed and with emphasis on the process, usually through innovation platforms, by which those interventions are determined. As discussed under alternative theories of change, EADD has developed a set of interventions—based on the substantial experience in dairy development of ILRI and its two partners - organized around the introduction of a chilling plant and a services hub which will be scaled out across very different production systems and market conditions in three countries. The forage innovation work, on the other hand, responds to persistent lack of adoption of cultivated forage species in mixed livestock-cropping systems and focuses on developing an innovation process for adapting forage systems and associated value chains to local conditions across a range of very different countries and institutional contexts.

The forage work was designed around an answer to that top-down linear approaches do not work in forage research projects. It would be interesting to compare the explicitly innovation systems approach in fodder projects to the blueprint approach in dairy systems in East Africa, particularly in terms of cost-effectiveness, scalability, sustainability, and impact. This larger question remains untested. ILRI needs to look more critically into its use of innovation systems approach and perhaps work out a typology of the where the different approaches of innovation systems as manifested

in EADD and the fodder projects would work and where it might not? Nevertheless, it would be possible to embed a more explicit innovation systems approach to forages within the EADD, which raises questions about whether a focus on just forages might be too limited in terms of an evaluation of the innovation system approach. The focus in the succeeding section will be on the design of the M&E system in relation to the research questions being addressed using the different approaches.

### 3.5.1 M&E within large Integrated Development Projects

***Project Objectives and Design:*** Both EADD and PROGEBE are seen as regional platforms both to have short term impacts on household welfare through project interventions but as well to understand better how to generate development outcomes through livestock value chains. These are multi-country in design, done within a value chain framework, and operate with a range of development partners where ILRI is not the lead organization. As stated in the 2009-2011 MTP, “ILRI’s role (in EADD) is guiding design, leading targeting of implementation to ensure benefits for the poor, and lesson learning from development interventions for wider strategies.” The outcomes are primarily framed within the Markets Theme, but include interventions from across the four themes. As noted by the MTP, “*Outcomes targeted by these technology and institutional strategy-related outputs are a) the sustained uptake of pro-poor institutional models and technologies, through improved capacity of development partners and b) demonstrated market innovations with international relevance.*”

These are relatively new ventures for ILRI. The critical tension in these projects is matching project objectives and design with the quite different objectives of ILRI in relation to development partners. The EADD project is based on expanding downstream capacities in formal milk markets, particularly in establishing integrated chilling plants and service delivery hubs. There are two design issues in this project. First as the work in Kenya and Assam in India suggest informal milk markets are by far the largest component of the milk value chain, the most direct avenue to reach poorer households, and potentially more competitive with formal milk markets in less developed milk markets such as in Uganda and Rwanda. Second is that there is a potential trade-off between reaching poorer milk producers and the commercial profitability of the chilling plants in terms of both their location and the milk surpluses generated by participating farmers. ILRI managed to get service hubs based on informal markets into the Uganda component of the project. Nevertheless, the issue of the relative competitive position of informal versus formal markets under alternative production systems, transport infrastructure and market conditions is probably the key issue in how to enhance productivity, quality, efficiency, and equity in dairy value chains—as for example the analysis in Assam would suggest. EADD provides only a partial test of this critical issue in the Uganda component, when the project offered the potential to provide virtually a conclusive answer to that question within an appropriate project design.

The PROGEBE project, on the other hand, combines conservation and development objectives, always an uneasy tension in an African context. The objective of this project is to preserve indigenous livestock breeds through improved commercialization of livestock from primarily agro-pastoralists and better links to market, potentially through higher value product differentiation. The debate centers around the feasibility of intensifying these systems through only animal nutrition

(note how forages again become a principal design element) and health interventions—given relatively limited potential productivity response for these relatively small breeds—, assuming that more effective links to meat markets can as well be established. The argument from the development side is that a crossing program with the indigenous breeds would provide the principal vehicle for system intensification and that is not being tested within the project, given its primary objective being preservation of indigenous breeds. A full test of these trade-offs would have been the logical design for such a project from the perspective of a research organization such as ILRI, as contrasted to the objectives of the Global Environmental Fund (GEF). Given that the funding comes from GEF, ILRI must adapt its role within a very much second-best research strategy.

This experience begins to frame a number of issues and lessons for ILRI in terms of its approach to large integrated livestock development programs. The first is that these projects would have had a significantly different design that tested research hypotheses of importance to livestock production if ILRI had been the lead partner in the project, but for development projects of this type, this will rarely be the case. IPMS is possibly an exception, but EPMR had difficulty with ILRI's lead role in this project. The second is that rather than testing alternative approaches to achieving development outcomes, such projects quickly narrow the objectives and design, probably the classic criticism of top-down development approaches. The third is that all the essential research questions are decided within the project design phase, when ILRI has significantly reduced input into project development and when research interests have second, if that, priority. The three lessons taken together create something of a Catch-22 for ILRI in defining its interests and role within such projects. At the time this experience highlights how tenuous is ILRI's potential role in facilitating impact and highlights even more the conundrum that IARCs face in having both to generate IPG's and to produce impact from its research.

***An Assessment of M&E Methods in Integrated Projects:*** The M&E within both of these projects focuses primarily on evaluating project impacts, and only more indirectly in aiding project management and implementation. Both have superimposed a with/without, before/after design in impact evaluation, which in turn has guided the sampling strategy and the development of the baseline survey. In both projects ILRI has assumed a larger role in M&E design than was originally planned, as both partners and donors have recognized ILRI's expertise in this area. As such, it gives ILRI the opportunity to improve the research outcomes from the projects, although project budgets for this component tend to be relatively tight and thus do not allow major expansion in this component without additional resources.

Because these projects are designed within a value chain framework, the sampling and survey design are hierarchical. The sites are pre-determined by project objectives, namely the commercial viability of the chilling plants in the case of EADD and the distribution of endemic breeds in the case of PROGEBE. Introducing as much randomization and variation into the site selection as possible improves the potential for generalizing the results. For EADD there was a distinct trade-off between the concentration of poor households, as established by the poverty mapping, and the potential for profitable operation of the chilling plant. The partners responsible for the chilling plants obviously had incentives toward commercial viability (as would a dairy company). However, for ILRI and its pro-poor mission, the

question is establishing the limit whereby the poor can access markets and the chilling plant remains profitable. ILRI is then interested in testing where that limit is and in turn where the focus should be on improving informal markets. Moreover, to meet the targets of poor households the poverty line was ratcheted upward to the \$2 a day international standard, but which is more than double the official poverty line in Kenya (and where more than 50% of rural households live below even that lower standard). In many ways this design issue is at the core of how ILRI thinks about improving the welfare of poor livestock producers through improved access to markets.

The design within a fixed budget of any quantitative M&E framework focused on evaluating the impact on household welfare will involve trade-offs between number of sites, number of households, monitoring frequency, and length of survey instrument. These trade-offs should be evaluated in respect to the research questions being asked. In neither case are these completely well specified. Moreover, as suggested above this would influence the choice between number of sites and number of households per site. For EADD given the site selection for the hubs, these can be characterized within a GIS system and spatially sampled on the basis of defined spatial strata defined in terms of agroecology, market access, and population density, i.e., all the principal variables that will influence both commercial viability of the chilling plant and impact on household welfare. However, this resulted in the selection of one hub per strata and 75 households per hub. As Hassan et al. (1998) noted for maize systems in Kenya, if the idea is to sample the variability in such systems, it is better to sample more sites and fewer households per site. However, if the idea is to understand the effect of both distance and resource availability within a particular milk shed, then the quite elegant spatial sampling frame developed for EADD provides an excellent solution. The point, however, is that the “optimum” design of such M&E frameworks are far from being resolved and these methods should be evaluated at the end of the project.

### **3.5.2 Experimental Methods in Impact Assessment**

ILRI is only beginning to utilize experimental methods using RCTs to test “proof of delivery” innovations. These methods are used to evaluate well specified and relatively limited interventions. For example, such RCTs were used in evaluating the impact of extension (distribution of a leaflet) on trypanosomiasis treatment in cattle. The research concluded that, “Giving rational drug-use information to farmers improved their knowledge and management of trypanosomiasis as well as clinical outcomes in cattle.” Such trials are costly and as in this case often produce a relatively limited but valid result. It does not answer the succeeding question of what extension method (for example, as compared to rural radio) is most effective and least costly. Designing such a comparative trial would have been exceedingly costly and with difficulty in developing control groups, given the potential reach of rural radio. Nevertheless, appropriate framing of the research question becomes probably the key criterion in deciding whether to apply these methods, given both their cost and usually their highly restricted set of interventions being tested. Such framing in an experimental design, however, does introduce rigor into thinking about alternative approaches and potential outcomes. Thus, would an experimental approach be more appropriate for evaluating alternative methods for conserving indigenous

breeds *in situ*, before moving to scaling up of a particular approach within a large integrated project?

Such rigor has been applied in designing and evaluating delivery methods for index-based insurance in relatively arid pastoral areas. The product development has been well thought through with remaining questions on the pricing of the insurance product, its extension to clientele unfamiliar with such products, and a cost effective delivery channel linked to financial services. Again there are major limits on how many treatment variables can be tested. Prices for the insurance will be varied but by income group (not different prices across different income groups) and the extension method using gaming will be fixed. The treatment variable is the delivery channel. However, this would be the critical information needed by an insurance company in assessing the pricing and delivery of such an insurance product. For marginalized groups such as pastoralists, assessing the private benefits and costs to an insurance provider with the social benefits derived from improvements in household welfare would provide as well the utility of insurance as a social safety net. Poverty programs could then assess the impacts derived from any subsidies on the pricing of the product. The latter could be done by utilizing economic surplus methods within an ex-ante impact framework.

Experimental methods are embedded within the larger question of the relative rigor in evaluating the piloting of new approaches and the utility of pilots in the design of larger “scaling up” programs, such as integrated livestock development programs. Piloting extends into such areas as designing delivery systems for infection and treatment programs for East Coast Fever, the Operational Research Project in Indonesia aimed at evaluating a suite of interventions against avian influenza (AI) in backyard poultry production systems, including preventive mass vaccination and culling with compensation fully provided (where experimental methods might be applied), or the evaluation of alternative breeding and genetic improvement strategies within different livestock systems. What is interesting about these examples is that a range of approaches remain within the choice set, even after significant evaluation of efficacy, cost, and risk assessment, and each may be appropriate under different contexts. Piloting thus requires considerable attention to the choice of alternative methods, the context under which they would be tested (and the potential for extrapolation outside the testing site), and the relative rigor in the evaluation. Funding availability often restricts or curtails decisions on each of these, so that the result may be in the realm of the second best. Nevertheless, it is pilot testing such as IBILI that will provide the needed credibility for ILRI to influence design of large integrated development projects. How scalable those results are, an important design dimension for some donors, will still only be apparent with the roll out of these larger integrated projects.

### **3.5.3 M&E within an Innovation Systems Approach**

ILRI has made a commitment to the adoption of innovation system (IS) approaches within its research for development activities; particularly “how innovation systems can improve livelihoods and reduce poverty” (see MTP 2009-2011, ILRI 2008). As framed within its 2008-2010 MTP, “ILRI is applying innovation systems thinking to the design and implementation of its research projects so as to better link research outputs to outcomes and impact; this process includes improving *ex-ante* project design and *ex-post* impact analysis to help ensure that ILRI research efforts are



appropriately targeted and focused.” It is probably fair to say that ILRI is still very much feeling its way in terms of how innovation system approaches will be applied within its research for development activities. The area has been reorganized within ILRI, particularly the creation of an OP for innovation systems in Targeting and Innovation and the formation of Innovation Works operating across the Center. There is still a question of whether the approach will be mainstreamed across ILRI’s research for development activities, and in this process whether the focus is on developing tools and methods and “moving to the application of innovation systems tools in feeding, breeding, health and livestock value-chain projects” (see MTP 2009-2011, ILRI 2008). The alternative, as structured in this review, is that innovation systems is only one among a range of approaches utilized by ILRI in translating research outputs into development outcomes, and is best exemplified by the IPMAS project and the work on fodder innovation. Achieving some clarity in how ILRI conceptualizes IS approaches and clarifies what the research questions are within those approaches and how the Center applies them within its research for development projects will be important for future project development and evaluation of the approach.

As argued through this report, IS approaches are an important alternative to how research for development projects is structured and implemented. Particularly, most of the principal design issues are left open and the focus is on developing a structured process by which those decisions are made by key stakeholders and the process is facilitated and adaptively managed (through “learning” feedback) in the course of its implementation. The approach ensures adaptation to local contexts, it relies on the availability of high quality research outputs, and it generates innovations primarily in the area of “proof of delivery”, e.g., in organizational innovations at farmer level, innovations for coordination within the value chain, policy innovations, or innovations in delivery of services, including micro-credit or insurance. As such, there is the potential, although not guaranteed, to benefit poorer income strata within the target area of the project. With a focus on the process, the orientation is toward quality facilitation and appropriate methods. Thus, TI03 “uses quantitative and qualitative methods, including actor linkages, stakeholder, institutional, and gender analysis to identify linkages, policy, and institutional innovations that benefit poor people in specific livestock contexts” (see MTP 2009-2011, ILRI 2008)

The review team thus feels it is important to distinguish between IS methods that can be applied within larger projects such as EADD or PROGEBA for such things as improved partnership development or gender analysis (and where they have recognized utility) and projects designed within an IS framework, such as the forage innovation projects. The distinction is important because it influences the future design of research for development projects within ILRI, and in that, it is important to recognize some of the trade-offs in project design within an IS framework. Puskur et al. (2009) identify two critical areas, namely generalization of results and scalability of the approach. To this can be added sustainability of the process after project termination, which is closely related to how IS approaches are financed. Finally, what is the learning that is generated by this approach? Does it essentially inform the stakeholders within the process itself, or are there either innovations or project results that can be applied in other contexts (and how is this determined) and thus inform “learning” by ILRI or international development organizations? As with the project design, the learning generated by the project is left relatively open, which has produced a tendency towards less rigorous site selection, sampling, and M&E

methods, all of which is a function of the objectives of the methods being applied more to internal (within the project) rather to external learning.

- ***Project Design within an Innovation Systems Framework***

From a strategic perspective, projects designed within an IS approach offer a couple alternative paths for expanding ILRI impact. Firstly, as the forage innovation project (FIP) argues (Hall et al. 2007) achieving impacts in livestock systems often relies more on building innovation capacity in delivery systems than on the technical innovations themselves. For ILRI is this just a matter of developing new tools and methods that facilitate the development of such capacity or is this a capacity that can be developed in what might be called national livestock innovation systems—with some question of how those might be structured? ILRI has not yet framed where and how the latter might be done. Nor is it a component as yet of capacity strengthening unit within ILRI. There is an assumption that the development of capacity in such an innovation system would naturally lead to enhanced productivity of the sector, again with questions of how and what would bring that about. Just focusing on forages is too limited to provide an adequate test of the approach, documentation of the process, and evaluation of the impacts.

Secondly, does an IS approach provide a research framework for evaluating alternative pathways to achieving development outcomes and therefore as input into the design of future projects. Then how are the research question articulated and the research methodology implemented? The IS approach, however, has particular limitations for this purpose. For example, for the phase II FIP project the hypothesis was specified as follows (Hall et al. 2007): ‘Generic principles on how to strengthen fodder innovation capacity can be derived by experimenting and learning from institutional and policy change processes across the local to national levels in India and Nigeria that are inclusive of the livelihood needs of livestock dependant poor people.’ This is more a statement of project purpose than of a testable hypothesis, and exemplifies the trade-off between the narrowness introduced in defining a testable hypothesis and the dynamic and multi-dimensional context of an IS project. The document goes on to argue that a control or counterfactual is not possible to define in such projects and that any evaluation must follow purely a before and after structure, within what might be called an action research modality. As such, the research leads to a series of case studies with the inherent difficulty of generalizing the results of each.

- ***M&E Approaches in IS Projects***

Because IS projects are carried out in an action research mode, the focus of the M&E is on adaptive management within the project rather than primarily on evaluation of project outcomes and their impact on household welfare. As noted by Hall et al. (2007), the M&E “is really a question of tracking institutional change over time and relating this change to likely and actual welfare changes.” It might be said that the focus is on producing change through improved “innovation capacity” rather than establishing causality between those changes and the development outcomes generated. Facilitating the interactions between a range of different actors becomes the primary focus of the methods employed, and these are drawn from a rapidly expanding tool box. There are excellent methods for the process monitoring and

learning, which are often weak or even lacking in more “top down” projects. Whether such process monitoring allows the establishment of causality between institutional changes and welfare outcomes, i.e., the basis for attribution, still remains relatively open, especially without more rigor in the evaluation of those changes in household welfare.

The approaches within the forage innovation projects (FIP and FAP) are somewhat different, although both rely on the development of a forage innovation platform. The FAP project has an interesting feature of multiple scales within the platforms, which would mirror the development of a larger livestock innovation system. Whether forages are sufficient to bring key actors together at national level will be a question. Also, the institutional contexts within which FAP works across Ethiopia, Syria, and Vietnam are so diverse that cross-country learning will probably be limited—as is the case for FIP working in Nigeria and India. Maximizing variability across all dimensions within such cross country work has little rationale, and will result in the production of some very disparate case studies.

With the focus on process and institutional innovation and change, there has been some tendency to lose sight of the forage adoption “problem” and the underlying theory of change. This is normally cast in terms of effective farmer demand for forages as a function of access to output markets, seasonal variation in availability and agronomic management, breed response to improved nutrition, and forage quality, the development of forage seed markets, whether formal or community or cooperative based, the potential development of forage markets, and access to and management of grazing resources. Can these platforms manage such interacting, multi-dimensional, and appropriately sequenced systemic interventions? Are there key intervention points depending on context and how are these identified, given that the whole system must function? Finally, how is change within such a complex system monitored and does this not require more conceptualization of how the different parts of the value chain are evaluated both separately and as a functioning whole? It is not clear across all of the approaches, not just IS approaches, that there is a monitoring and evaluation framework for assessing systemic change across a value chain.

### **3.6 Ex-Post Impact Assessment**

As has been discussed the use of the terms, R&D impact and especially impact assessment or evaluation, are widely used and mean different things to different people. The term ex post impact assessment (ePIA) is usually used to describe assessments of the impacts once the research activities have fully finished and the outcomes have had a chance to be adopted. Until recently it was primarily used to refer to a relatively narrow set of studies which use an applied welfare economics based framework to quantify R&D impacts and determine estimates of the total community welfare gains from this R&D activity and, if required, the distributional consequences on different community groups. In the CG System the abbreviation ePIA has been used to refer to this particular type of ex post impact assessment (see SPIA Report, 2008).

During this review and it seems at ILRI in general, ex post impact assessment has been used to refer to all possible assessments which may be undertaken after the R&D activities have been completed. There is a need to be clear about what type of

assessment is being referred to in any particular discussion. Currently ILRI has a range of reports that are prepared at different times and for different purposes which fit into the category of evaluation and assessment.

At the end of all projects there are detailed reports which usually include comments and information regarding expected outcomes and impacts from the research along with any adoption which has already occurred by that time. These reports are part of the M&E process. Recently ILRI has developed what are called short 'Outcome Statements' which provide very useful quick descriptive outlines of what outcomes have been produced and how they are available for use.

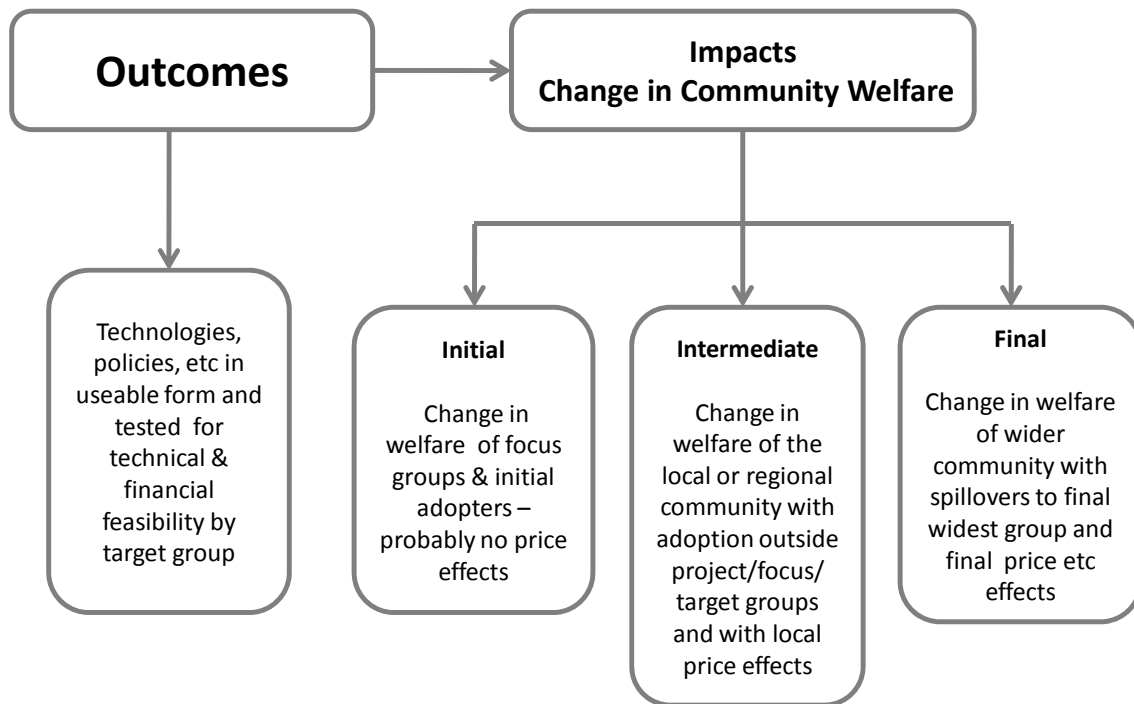
In the past there have also been adoption studies which have been variable in coverage but have undertaken careful, detailed studies of the uptake of the research outcomes from projects. These adoption studies can be an important intermediate stage in keeping track of the impact of the research. If they are undertaken three or so years after the finish of the research and development phases they give a good picture of what is starting to happen and also a very good basis for future more detailed impact assessment studies, ePIAs.

More recently ILRI has received requests from some donors for simple index measures of impacts. These are usually included as part of the monitoring process during the project activity and developed from baseline studies undertaken at the start of the project. It is too early to see what the final nature of this type of ex post impact assessment report will be like. However, simple indexes need to be developed and used with caution as they could well misrepresent the more complex impacts. Ideally they should be developed using a consistent, systematic underlying impact assessment framework to avoid these possible errors. This does not necessarily seem to be happening. Another cautionary note is needed to distinguish between what donors might want as a development impact versus what ILRI might want to learn about the impact of the research itself. Again, these indices are probably not the same measurement.

Finally ILRI has undertaken a limited number of ePIAs which have quantified the full impacts of the research some time after the project has finished. Because these types of studies were given prominence in the TOR for this CCER they are considered in more detail in the rest of this section of the report.

- ***Using Impact Assessment***

It is useful to consider some aspects of a simplified schematic of the last two stages of the research to impact pathway. This is summarized in Figure 1. As was suggested above it is only once outcomes have been generated that ex post impact assessments become relevant. Here outcomes are defined as the products of the research which, if used, result in some change and also have been tested and checked, perhaps with target groups, to ensure that they are technically and financially feasible to farmers or other user groups. At this stage the users have probably not changed their activities and there will therefore not be any measurable impact.



**Figure 2: Stages in the R&D Process for Ex-Post Impact Assessments**

Three stages of ‘impact’ are illustrated. Initial impact occurs once the focus group, and perhaps other early adopters, start using the project outcomes and changes in their farming or other activities take place. At this time it is probably only the welfare of these users that is changed by the research outcomes. That is, the scale of adoption is not very large and/or the changes have not had time to work their way through markets and institutions.

Intermediate impacts occur when the outcomes spread to a wider group within the focus region or even wider. By this time the change in production or other activities has occurred for long enough for the prices in markets, for example, to adjust. The welfare impacts have also now become more widespread and complex. In the case of research outcomes which are adopted on-farm, the adopters will have improved their welfare as may that of groups off farm, for example, consumers, market service providers, etc. However, now there are almost certain to be others whose welfare has been reduced. The most likely group will be farmers who have not adopted the research outcomes. In many cases these are members of the most disadvantaged groups.

Final impacts occur when knowledge of the outcomes has reached all those for whom they are potentially relevant and adoption has reached its full potential. At this stage country, or multiple country-wide welfare change impacts will have been generated. The complexity of the welfare changes has now increased considerably and the scope for a complex set of negative impacts is high, if not certain.

From this discussion it is clear that the project reports will cover probably just the 'outcomes' activities, the rest have not taken place at that time. The 'outcome statements' report primarily the outcomes activities but may also include some aspects of the initial impacts. Depending on the timing, the adoption studies are likely to cover the intermediate impacts and possibly final impacts, but unless designed very carefully will not pick up the price effects. Since they usually do not look for details of all welfare changing effects they do not usually measure the total welfare changes. Adoption studies usually focus on telling the important adoption story.

The impact indicator measures and reports have not been used yet in any detail in the respective projects, so it is not clear at which stage they are developed. Based on discussions, though, it is most likely to be at the outcome stage of the pathway, since the requirement of the donor is that they are included in the final project report, if not in annual M&E reports. These indices are also often estimated from the target group used for the project. In light of the above discussion these impact indices, unless carefully developed, will certainly miss many of the impacts and especially any negative welfare changes, especially due to price change effects.

The ePIA impact assessment reports, if developed rigorously, provide estimates of welfare changes at all stages of impact. The theory they are based on is specifically targeted at measuring total welfare changes. In the early year analyses they also pick up the initial and intermediate impacts through the adoption information required for the analysis. The important issue is the complexity of the analysis; this requires considerable expertise in applied welfare economics analysis and understanding the underlying theory and the information/data requirements. This is especially the case if the details of the distributive effects are required, as is the case for ILRI with its poverty reduction focus.

Even if designed well, for the adoption studies and impact indices to consider the final impact stage, it will still be difficult to separate out the effects due to just the research outcomes and any other changes in society and the economy which takes place as time passes. On the other hand the welfare economics based framework is designed to facilitate this separation, again though this is all dependent on the quality of the analysis and the availability of the information needed to undertake it.

- ***ILRI's use of Ex-Post Impact Assessment***

The rest of this section will focus on the ex post impact assessment, ePIA, activities at ILRI, since this was the requested focus of the TOR for the CCER.

ILRI (and its predecessor institutions) has had a long history of ex post impact assessment activities. For many years they were undertaken mostly on an *ad hoc* basis and the coverage, type of methodology and scope varied considerably. Prior to 1998 this was especially the case. At that time a dedicated group was established, the Systems Analysis and Impact Assessment unit. This unit had several roles but one being to strengthen this area of activity and integrate it into ILRI's impact assessment activities. A review of all past impact assessment activities was undertaken and provided to the pending EPMP. One recommendation from that EPMP was that ILRI should develop a clear strategy for both ex ante and ex post impact assessment. This was done from about 1999 with a comprehensive program

of both ex post and ex ante studies. An ILRI Impact Assessment Series was started to regularly and consistently report these studies.

As has been discussed elsewhere, with the restructure of ILRI's programs in 2003 the System Analysis and Impact Assessment unit was included in the new Targeting and Innovations Theme. When the work program for this group was developed it was decided that the emphasis in the impact assessment area would be on the ex ante priority guidance component. As a result the ex post welfare theory based analysis was basically halted. In addition, for the ex ante impact assessment focus the framework and methodology used shifted from a welfare economics base to systems analysis, GIS mapping and broader poverty surveying linked to these efforts. As highlighted elsewhere in this report, this ex ante impact assessment activity has been extensive and has undoubtedly made an important contribution to the noticeable change to an impact culture at ILRI.

However, what this change meant was that for five years there were no new ePIA studies. In addition this shift in emphasis changed the incentives environment for the team of economists at ILRI, encouraging them to change their research focus. This has also been reflected in the skills base as new staff recruitment has taken place. The CCER team observed two important consequences: first, most economics staff indicated reluctance to maintain or develop their skills in this area and second, the level of expertise and skills in the applied welfare economics area is disappearing. The outcome is likely to be a reduced chance that decision making at ILRI will be alerted to possible negative distributional implications of its research focus. Although these may not show up in the community for some time the implications are important given the strong poverty focus of the institution.

There have been two developments since the 2003 restructuring which have had an impact on this environment and have probably been responsible for this CCER.

The Science Council via SPIA has developed a rigorous program requiring high quality ePIAs from all CG Centers on a regular basis. It is difficult for Centers not to comply with this strong accountability requirement. Discussions with staff suggested that the driver for the SPIA ePIA activities seems to be the Management Committee.

The 2006 EPMR team strongly recommended ILRI develop a rigorous ePIA program after observing that this expertise and information had been given low priority and was disappearing (pp. 52-53 of report). The ILRI Board in their response to the recommendations agreed that 'ILRI will take steps to strengthen its ex-post impact assessment capacity.' The Board also noted that the 'Impact Unit' would take responsibility for this. A Task Force was established to effect this strengthening but during discussions it was indicated that they had met only twice and were still developing a strategy which this CCER will feed into.

Table 7 summarizes all the quantitative impact assessment studies which have been undertaken using a broad final impact focus. It includes two studies which are not ePIAs in that they do not estimate the welfare gains. They are important studies though for this review so are included in the Table.

**Table 7: Summary of ILRI Ex-Post Impact Assessment (ePIA) Studies**

Year of Study	Brief Title	Publication	Research Area	Type of Study	Methodology	NPV	IRR	B:C
1999	Planted forages in West Africa	ILRI IAS No 2	Plant improvement	ePIA Stage I	ES	65.9	ne	7.1
2001	Bed Making Plough Technology	ILRI IAS No 7	Farmer Practices	ePIA Stage I	ES	-12.6	na	0.01
2008	Goat parasite management	ACIAR IAS No 57	Farmer Practices/Pests	ePIA Stage I	ES	A65.5	24.7	10.4
2009	Bed Making Plough Technology	ILRI R R No 20	Farmer Practices	ePIA Stage I	ES	47	10	3.3
2009	Dairy Marketing Policy SDP	ILRI R R No 15	Policy/Farmer Practices	ePIA Stage I	ES	230	55	ne
1999	Small Holder Dairy Technology E Kenya	ILRI IAS No 5	Farmer Practices?	Adoption Study	Survey Econometrics	na	na	na
2001	Graduate Fellowship Program	ILRI IAS No 8	Capacity Building	Qualitative	Survey - tracer study	na	na	na

However, in total over ILRI's (and its predecessors) history there have only been five full ePIA studies which have estimated full welfare impacts of research activities. Of these two have been for the same research with a recent study up dating an earlier one and the other was undertaken via the impact assessment strategy of another institution, the Australian Centre for International Agricultural Research (ACIAR). By the standards of many research organizations, CG and others, this is a small number. The sample size is too small for the information to effectively feed into the decision-making processes. It is not surprising that this review group found very little support for this type of impact study at ILRI. There were a few isolated cases when research staff commented very favorably and looked for more studies but this was not the general feeling. On the other hand some comments during the review process suggested that another reason was that many did not like the results from these ePIA studies and that it was difficult to find research activities with results which have had an impact.

In summary below are the important points from this review of past and current ex post impact assessment activities:

- A broad program of ex post impact assessment activities is important for both accountability and learning. ILRI has dimensions of this currently with outcomes reports, adoption studies, beginning simple indicator reporting and rigorous, quantitative economic welfare theory based studies, ePIAs. However, the review group found that the strategy for and process for operationalizing this program are not very clearly defined and certainly not clearly understood within the institution.
- ILRI has a long history of doing ex post impact assessment studies. However, this has mostly been on an ad hoc basis and not many have estimated full welfare impacts using a rigorous, applied welfare economics theory based approach, which the CG through SPIA have called ePIA Stage I & II. For a period 1998 to 2003 there was a systematic attempt to develop this, however,



this did not last for very long – not long enough to become part of the culture nor to generate sufficient quantitative impact results to be very useful. Experience in other institutions where this has been successful suggests that a sustained and concerted effort is required for 10-15 years for this to be achieved.

There has been a significant demand for rigorous ePIA outside ILRI in the CG system in general but also from the regular reviews. However, during the CCER it became clear to the group that interest in and enthusiasm for the rigorous welfare theory based ePIA is no longer strong. This means the capacity to undertake such studies is dissipating. This is not unusual since good quality ePIA studies are demanding and require significant resources. Unfortunately these types of rigorous welfare theory based studies are the only ones in the suite of methods that are available and used in ILRI which can systematically include complex distributional implications. Some of these have been shown by others to be negative if not for the project target group (although even sometimes for them in the longer term) then nearly certainly for other groups who are also in many cases poor. The result is that these types of issues are not being and will not be raised in ILRI's decision making environment. Based on discussions for the case studies the group considered, it seems very likely that some of the large projects ILRI is involved in or developing will have these negative impacts. This is only an intuitive judgment at this stage given the short time that was available to the group to look at this issue but it feels this could be important. However, there is some evidence that this does apply to ILRI activities. For example, in the recent ePIA, reported in ILRI Research Report No 15 by Kaitibie et al. (2008), it was mentioned in the conclusions that these negative impacts were likely but required disaggregation of the analysis and use of a through-the-chain welfare framework. It is strange that these two extensions to the analysis were not included in the study since they are methodologies which have been used extensively and have been available in the literature for a long time. Also while the randomized baseline surveys being included in several recently developed R4D activities are an important development, by themselves they cannot identify these negative and disaggregated welfare impacts. They require integrating with welfare economics based analysis to separate out the effects due to the R4D outcomes and other exogenous influences which will also be taking place over the course of the research and then adoption periods (the counterfactual).

### **3.7 Data Collection and Use**

Livestock systems are extraordinarily data intensive to monitor and evaluate, much less as a focus on understanding both technical change and capital accumulation in these systems. The intensity and cost of the data collection process is in general related to the question to be asked, the rigor in the analysis, the ability to survey/monitor a farm sample through time, and where the project or activity sits within the research to development continuum. Moreover, there is usually an inverse relationship between the intensity (number of variables and periodicity) of the data collection process and the number of farms/villages/regions in the sample. The high costs and complexity of farm-level data collection would seem to put an emphasis on understanding what data are necessary for what level of analysis, ensuring a certain level of data standards for comparability across systems and through time, maximizing the use of existing data, integrating data collection on systems

performance with modeling frameworks, and ensuring learning within the Center on the efficacy of different data collection methods. The impression of the review team is that the whole issue of data collection and archiving is not considered to be a core problem. Yet the team noted the highly fragmented approach to data collection on livestock systems across the Center, the increasing reliance on simpler indicators with little to support how critical those indicators are to measuring system performance, and with little learning across the OPs and themes on cost efficient data collection methods. Moreover, understanding increases in production and economic efficiency and sources of productivity growth are in the end critical to any ealA or eplA.

At ILRI, the Research Methods Group (RMG) provides support to all other units in terms of expertise to help formulate and design projects and by providing access to data including spatial data (e.g., GIS maps) needed for design, analysis, and planning. The need to be able to extract information over the long term, at any time, and to undertake unexpected or unforeseen analyses is recognized. The RMG provides effective technical oversight on sampling strategies, statistical methods, and data collection procedures, but it acknowledges that this is done on the basis of scientist and project demand and moreover it does not actually hold much of the data that has been collected by ILRI. Most of that rests in the hands of individual scientists.

In collaboration with ICRAF, a document (Research Data Management and Archiving Policy) was recently drafted that outlines a strategy for data management. Serious issues of accessibility, a meta-database versus a catalogue of data files, storage/server problems, open source versus non-open source data, and the lack of a data management policy specific to ILRI are still not resolved.

Managing the huge amounts of data that currently exist and the continuous accumulation of data requires decisions that ripple throughout ILRI's work. There are two ways in which data could be managed. ILRI and RMG could continue to acquire and use existing data, compiling it into a meta-database that can be useful to all scientists and would be particularly important to the modeling and characterization work of TI01 and the future eplA studies that could be done. Or RMG can attempt to develop a sampling framework (design) and minimum data set protocol that is generic enough so that it could be used as the core framework for sampling and core systems data collection by all projects, recognizing that each project will have further unique data collection requirements. While RMG is heading in the latter direction, many donors have specific types of indicators and even impacts they wish to achieve and thus donor needs drive the kinds of data collection as much as the research needs. The scientists whom we met with seemed to start *de novo* in terms of data collection for most research projects, i.e., each new project seems to require a new set of baseline data. One exception is the extensive use of the GIS information for site selection, especially with poverty mapping. Nevertheless, sites are rarely randomly selected and only occasionally are sites selected because there is a lot of data on those sites (e.g., dairy projects).

What prevents scientists from using existing databases? If the databases are used, what are they used for, e.g., site selection, baseline information, or developing stratified sampling frames from a pool of existing data? As an example, the SDP pooled data analyses to look at driving factors behind dairy intensification; that analysis was used to inform the design of the EADD. However, this use of previous

project data to design new projects seems to be the exception, rather than the rule. Scientists believe that the Targeting TIO1 should be involved in helping them develop these types of ex ante assessments, especially for planning decisions but it is unclear whether or not if and when Targeting is involved.

Two examples of the differences in data management requirements are highlighted by the PROGEBE project in West Africa and the EADD project in Kenya, Uganda and Rwanda. In the PROGEBE project indicators are development oriented and are not at this point in time research indicators useful for ILRI. For the baseline surveys, the project is taking a modular approach to data collection which is supposed to be linked to the M&E framework being developed by ILRI scientists. The regional indicators are AfDB focused (e.g., kms of roads built) and not research focused (e.g., livestock numbers). The country sites are not randomly selected or in areas of greatest research interest. ILRI has tried to harmonize or align the indicators within the baseline sampling framework but has not been totally successful in doing so, especially since the donor has a different approach and idea about the types of indicators it wants.

In the EADD project, the main objective is to improve the livelihoods of people involved in the project and, eventually, in the region. Three different implementing organizations (Technoserve, Heifer International and ILRI) have different data needs and different approaches to acquiring that data. On top of that, the donor (Gates) has yet other indicators it wants to see measured but is not willing to negotiate around how to collect that data. The current baseline and M&E indicators may not be able to tease out research results because there are no control sites to represent the true counterfactual. With the sampling, EADD will attempt to show that sites are representative and generalizable. Still, the indicators chosen by the donor for mid-term evaluation are not in alignment with ILRI's impact objectives. Thus, it will be difficult for ILRI to attribute certain impact to ILRI specific activities on the project. As noted earlier, ILRI's input into project design was based on knowledge obtained from earlier dairy projects.

Scientists cannot be forced into using data without a solid reason for doing so. RMG is going in the right direction by developing survey designs and providing useful data to project managers. It might be worth investigating the costs of acquiring new data via baseline collection surveys versus the cost of using existing data to design a new project. The continued use of "informed expert opinion" would likely not survive such scrutiny.

### **3.8 Impact Pathways, Partnerships and Capacity**

- ***Impact Pathways***

To reiterate from an earlier section an impact pathway begins with problem identification and conceptualization and moves toward ultimate goal 'big picture' impacts, e.g. poverty alleviation. International agricultural research at ILRI and elsewhere is required to demonstrate specific impacts on poverty while also producing 'international public goods' (Kristjanson et al. 2009). In an ideal situation, the problem identification and conceptualization of the research program would be informed by previous impact assessments, especially ex post IAs. In most cases, it

appears that the ideal is not achieved and it is more common to use expert judgment and other considerations (e.g., donor objectives) to design research projects.

ILRI's 2003 center strategy moved toward pursuing impact as the driving force for ILRI research. Main ILRI pathways were developed:

- Livestock productivity is sustainably increased
- Livestock market access is enhanced and incomes of the poor increased
- Vulnerability is reduced in livestock based systems

ILRI included partners in its strategy document as integral to achieving the impacts sought. In 2008, a partnerships document was developed to lay out a strategy for achieving successful partnerships.

#### ▪ **Partnerships**

As ILRI integrates the importance of learning into its processes, it becomes ever more crucial to develop more efficient and effective partnerships at all levels. As noted in ILRI's 2005 annual report, *Knowledge to Action*, the key to sustainable poverty reduction appears to lie in investing in appropriate partnership processes and tools at the outset of any project. ILRI now prioritizes partner input, in part to do better research and have better impacts but pragmatically because donors want to hear partners' voices. A CCER was commissioned to analyze that state of partnerships; the result of that was the document, *Partnership Strategy and Management System* (ILRI, 2008). The document not only describes the vision, principles and objectives of partnerships, it also explicitly details how to set up and manage such. It seems, however, that the partnership strategy and management system is new enough that not every ILRI staff member or partner is aware of it.

Assuming, however, that ILRI will continue to seek and develop partnerships, it is worth discussing how partnerships contribute to successful outcomes and the issue of assessing the impact of a partnership. Clearly, ILRI cannot function in a vacuum and must have partnerships to conduct its programs. Transaction costs must be weighed against potential outcomes and impacts. Often, ILRI has to build capacity of its partners in order to meet goals and objectives. What is perhaps not well recognized, although noted in the partnerships document, is that ILRI itself has to learn how to build and strengthen partnerships and how to operate these transparently. Partnerships lend themselves to dual impact assessments objectives of accountability and learning both on the part of ILRI as well as on the partners' side.

#### ▪ **Capacity**

New capacities are needed if new approaches are going to be used to reduce poverty and assess impact (Kristjanson et al. 2009). Capacities include technical skills and other communication and facilitation skills. Technical capacity includes changing organizational procedures. Organizational learning capacity has to increase as well as the capacity to work with partners.

- Improve capacity to scale out research findings to increase impact
- More effective use of business process tools to improve performance

- More effective communication of research results and impacts, strategically, internally to ILRI and externally

Innovation Works (IW) is meant to work cross-sectorally to help ILRI staff with tools and processes for stakeholder engagement, outcomes and impact assessments, negotiation and strategic communications. The types of capacity building needed include:

- ILRI to get research into practical use, to get scientists to think about the impact of their research efforts, and to be able to work more effectively with development partners during the research phase and after, in communicating the results broadly.
- Staff competency to work and manage partnerships is likely to be required of all ILRI staff. Periodic review of partnerships is meant to be built into every partnership arrangement. It is unclear how this monitoring occurs, who is responsible, and who makes the decision to start or end a partnership based on outcomes or impact desired.
- Involving partners requires communicating openly throughout the entire project cycle or, at the macro-scale, for years with government and donor partners. ILRI provides capacity building to partners in a myriad of ways, from short-term to long-term (e.g., inception workshops, short courses, degree programs, Biosciences in East and Central Africa, BECA, and the like) as well as through its publications, websites, and by sharing positions to name a few. People and partnerships constantly evolve; capacity building is an on-going process.

However, what has not been addressed is how the improved capacity is going to be measured? Identifying metrics for assessing improved capacity in the short term is exceedingly difficult while often the long term impacts are simple presumed and not measured at all. Payoffs to long term degree training, for example, notably may take 10-20 years, long after a program has been completed.

## **4. Synthesis and Recommendations**

### **4.1 Ex-Post Impact Assessment**

Achieving widespread impact (of the type generated by crop programs) with research outputs in sub-Saharan Africa has eluded livestock research programs on the continent. Rather, impacts have been both limited in number and highly circumscribed in terms of technology, geography and level of adoption, at the same time that markets for livestock products have expanded rapidly on the continent. Production system Intensification serving higher value markets, such as dairy production in Kenya, has relied on existing technologies of Napier and elephant grass for forage, cross breeding with imported genetic stock, and relatively traditional animal health management methods. Where projects have attempted to extend such systems as intensive dairy production into non-traditional areas, as for example into the coastal area of Kenya, adoption has been limited (Nicholson et al. 1999) and with significant rates of disadoption. Thus, it is not surprising that only five ex post impact studies have been done in ILRI over the review period, that impacts essentially derive from the projects that are undertaken, and that ILRI is devoting

significant attention to how to improve its impact performance, in part through this review. At the same time the constraints on livestock system performance if anything are becoming more severe and the need for improved productivity of these systems more pressing.

An impact culture at ILRI is thus not defined in terms of its capacity to undertake impact studies but rather in terms of an enhanced effort focused on **how** to generate increased impacts on target livestock systems in target regions. An increasing proportion of ILRI's project portfolio is made up by what are best termed research for development (R4D) projects. This trend is as well congruent with shifts in donor funding and will probably feature prominently in the design of the mega programs under the CG reform process. How to generate increased impacts thus becomes a research question in itself, and if that is accepted, the issues then become how best to formulate that research agenda and implement it within these R4D projects.

The EADD and PROGEBE projects represent a qualitative change in how ILRI pursues impact, in many ways building on the experience in the smallholder diary project (SDP). In the past, and this trend is reinforced by the logic of the MTP, each research output, whether that was trypanosomiasis control, vaccines, animal breeding methods, zoonosis control, forages, etc, was defined by an impact pathway associated with how the research outputs would be delivered. Assuming widespread uptake, the impacts on productivity, poverty, and sustainable land management follow, although these are largely undefined and uncertain until an ePIA is done. Although few ePIAs have been done, focusing on single interventions would appear not to release the productivity growth that is being sought. The two projects above rather intervene at all constraining points in the value chain and offer multiple interventions in target livestock production systems. Will such projects provide a seed for sustained growth in the value chain and increased productivity of production systems? Will they provide avenues for continued participation of the poor in livestock systems and markets? Possibly, most importantly how do relevant OP's align their activities within this more integrated approach?

The review of the four projects above suggests that there is no overarching research agenda that is informing the development and execution of the R4D project portfolio. Moreover, there has not been any systematic synthesis of the ePIAs that have been done in ILRI that might suggest components of such a research agenda. As might be expected with reliance on project funding, serendipity has played the largest role in the development of the portfolio, and this has resulted in the application of very different approaches in their design. This has come with some loss in terms of more systematic understanding on releasing the constraints to sustainable intensification of livestock systems.

At the heart of the CCER on intensification of mixed crop-livestock systems, as well as this review, is the development of a research and development strategy that can be framed in a more systems framework. The intensification CCER (Tarawali, 2009) frames the output to outcome problem as follows, "ILRI's research targets intensifying crop livestock systems where research outputs from the synthesis, generation and application of new knowledge leads to development outcomes including increasing income and employment from livestock, increased livestock trade, reduced price of livestock products, achieved in ways that utilize land, water and livestock genetic resources more efficiently." There is both a research and implementation agenda on how those outputs are translated into outcomes. The

framework goes on to identify such an implementation framework consisting of the following elements:

- “targeting systems and regions (e.g., where there is significant market demand for livestock and where many poor could participate);
- analysis of market based value chains within regions/systems to enable key entry points to be targeted;
- facilitating improved functioning of diverse value chain elements to ensure pro poor enabling environment and competitiveness;
- ensuring sustainable increases in livestock system productivity to enable market participation”.

The framework essentially says that the specific context (defined by system, agroecology, and market/value chain) shapes the intervention possibility set at the heart of project design (and this context needs to be understood), that critical input and output market functions must be in place and those missing functions specified, that coordinating development of missing market functions and increased efficiency within the value chain requires a platform for market actor interaction, and that while the incentive environment may be in place, this still does not guarantee the delivery and adoption of the appropriate breeds, nutrition, and health interventions for sustainable system intensification. This suggests an evolving framework for more integrated approaches that should drive project design and implementation and yet each of the R4D projects had different elements. Moreover, such integrated approaches have within them a significant number of unknowns and these should lead to the specification of a research agenda for understanding system intensification in the target regions. This in turn would further understanding of project implementation under different contexts and enhance the effectiveness of project implementation across the four (or possibly more) elements.

**Recommendation:** Given continuing expansion in integrated R4D projects in terms of number, approaches, and objectives, their management across a range of different OPs, and their important role in understanding how to improve the impact of livestock research in Africa and Asia, ILRI needs further clarity across the Center on their role, implementation, and the research agenda that justifies ILRI’s participation. Imposing a research framework on what are essentially development projects has been found to be difficult, and avenues for harmonization of objectives across partners need to be found. Some centralized coordinating capacity—see section 4.3—is needed to oversee early participation in project design with development partners, a framework for internal peer review of such projects within a better developed set of design criteria, and a periodic internal review of the overall R4D project portfolio.

As the analysis in section 3.5 highlighted, the three approaches being pursued in the design of R4D projects involve quite different objectives and designs, although all are framed within the purpose of generating impact on development outcomes. Part of the rationale for the last recommendation is that there needs to be greater clarity within ILRI on when each of these approaches is best utilized in project design. At their heart they involve real trade-offs between research objectives and implementation effectiveness. For purely research objectives, experimental approaches within randomized controlled trials have the appeal of research rigor but the limitation of very narrowly defined research questions which can only evaluate

highly focused aspects of an overall theory of change. Experimental methods can probably be more widely used in ILRI but this depends on the evolving research agenda within this area of how best to generate development outcomes through livestock production and market systems. The Research Methods group has a very important role in assuring appropriate design for what are quite costly projects, although not approaching the costs of an integrated livestock development project.

- ***Positioning Innovation Systems***

Innovation system (IS) approaches likewise have not as yet found their true role within ILRI. IS tools and methods have a role in improving the implementation of projects such as EADD or even IBLI, but this does not represent the application of an IS approach, in which most of the traditional project design decisions are made within the context of a structured and facilitated process among principal actors in the value chain (and not by project designers). Moreover, there are major limitations in utilizing IS as a research methodology in evaluating alternative paths in generating development outcomes (partly because the outcomes are unspecified). As Spielman et al. (2008) notes:

“Currently, the favored methodology in the study of agricultural research in developing countries is the descriptive case study, often drawn from an action research or stakeholder analysis exercise. More often than not, studies are simply ex post descriptions of the dynamics and complexities of some technological or institutional innovation. Powerful tools that are systematic, replicable, and consistent methods of analysis that could be used include in-depth social and economic histories; policy benchmarking, cross-country comparisons and best practices; statistical and econometric analysis; systems and network analysis; and empirical applications of game theory, to name but a few. This methodological diversity and rigor could bring greater credibility and strength to the study of innovation systems in developing-country agriculture.”

The vision for IS must be functioning livestock innovation systems in key target regions, which would in turn draw on ILRI’s research outputs—in essence the responsibility for development outcomes shifts from a dual responsibility in R4D projects to the direct responsibility of the innovation platform. The utilization of IS approaches within the forage projects is primarily a validation of the approach, particularly if it can generate a functional forage “value chain” across the different countries. However, assuming validation of the approach and the methods development that supported it, ILRI’s comparative advantage in future projects becomes uncertain, given that other institutions can provide such facilitation and project implementation expertise. That is, over time the focus of this work shifts to how to build capacity cost-effectively in IS. The scaling out here is of the approach and one of the key issues is that the approach requires extra-organizational financial resources to fund the transaction costs inherent in IS platforms. Furthermore, it is not clear whether IS would become the strategic focus of CaST activities and what those activities would be.

A basic question remains open of how a livestock sector innovation system would be structured within different institutional and market contexts? The vision is that country level innovation systems would become the essential interface with ILRI’s research outputs. However, how would such an innovation system be structured, at how many hierarchical levels, whether differentiated by value chains, and which parts



are stable and which task dependent? Both the forages and breeding research components in ILRI focus on developing capacity in national programs within the frame of new methods. Apart from the vaccine work, animal health has many of the same elements. Innovation systems thus become a potential framework for integrating markets and livestock system intensification through the lens of a shifting set of innovation platforms. At this level links to policy would also be an integral part. Innovation systems in this sense thus become both a research issue, in the frame outlined by Spielman et al. above, and a capacity development issue. Again, the latter would as well require some significant re-conceptualization of the role and strategy of the Capacity Strengthening Unit.

**Recommendation:** Given the expanding role of IS approaches across a range of project, research, and service functions, TG03 should develop a medium term strategy for IS within ILRI, bringing greater clarity to defining the Center's role and comparative advantage in this evolving area. Design and testing of a livestock sector innovation system would appear to be a high priority. At some point ILRI needs to assess, possibly based on the sector wide IS, whether IS approaches can be scaled out to target countries and how they would be financed, and thus whether they become a principal avenue for expanded impact, based as they are on adaptive approaches.

#### ▪ *Managing Regional Projects*

In the last couple years ILRI more by opportunity than design has become partners in large, multi-country integrated livestock development projects. The conclusions from the analysis in section 3.5 is that ILRI has not been able to exploit fully the research potential on understanding development outcomes offered by these projects, that their potential role as a vehicle for testing research outputs from ILRI's programs is as yet limited, and that their role as a regional platform for ILRI for integrating other diverse research projects into a systems framework is untested and highly dependent on partnership arrangements. What is clearer is that these projects, together with the evolving program in Asia, has moved ILRI toward more regional approaches, although the program in Southern Africa does not yet have a critical mass of projects. The question is whether regions become a logical framework for ILRI in organizing its R4D work, particularly since there is no clear home for most of these projects within the OP research structure—their allocation across OPs is in many cases somewhat arbitrary.

Looking forward to the possibility of management within a results framework, greater specificity will be needed in terms of how development outcomes are specified and quantified. It is hard to avoid the fact that these would almost have to be based on regional strategies. Given that ILRI is only just sorting through its thematic strategies and Center-wide strategic objectives remain at least unquantified, adding a regional dimension to an already complex process may be a bridge too far. However, the timing is probably right for at least a thought exercise.

**Recommendation:** ILRI should assess the most appropriate structure for managing and evolving its R4D project portfolio and how it interacts and intersects with the theme and OP structure.

- ***Further Thinking on Achieving Impact***

Given, then, a progressive consolidation and, as importantly, differentiation of the R4D work, how then is that articulated within the OP and theme structure and how does such articulation enhance impact orientation? A further couple observations might be useful at this point. Firstly, projects drive the research that is done at ILRI, as in other CG Centers, and ILRI has worked hard over the last five years to bring greater coherence to its project portfolio and to give direction to the development and writing of future projects. The MTPs have, if anything, forced Centers at least to think how to aggregate projects into some sort of programmatic structure. More than mere aggregation, ILRI has over the last few years developed a process to give the OPs and eventually the themes more strategic direction, part of which has involved a significant involvement by Innovation Works in using outcome mapping to give this process some additional structure. The test of how successful this will be is whether evaluation and impact assessment can be done at an OP project portfolio level measured against progress on defined outcomes, rather than just evaluation at an individual project level. It is probably fair to say that very few OPs have reached this level. In the end, however, this will depend on whether the OP can bring strategic coherence to the evolution of its project portfolio, and that will depend on the ability to direct and align funding opportunities, which is no easy task.

Secondly, achieving strategic coherence at a thematic level, i.e., in terms of the interaction and integration of the OPs towards larger development outcomes, is underway. The outcome mapping has found it quite difficult to map theme level outcomes at a Center level into a strategic focus on impact targets (aka strategic objectives). This is partly because the three impact pathways are not specified well enough to serve as impact targets and partly because there is a natural strategic coherence for two of the themes, whereas the other two (PLE and TI) are saddled with trying to integrate very disparate OPs where there is little scope for higher order linkage and integration. As a result, there have been significant changes in the OP structure of these two themes over time, in response both to the EPMR and to Science Council comment on the MTP. This, in the end, is a parking problem which will only be resolved over time with further evolution of the theme structure. In particular, there is no program that focuses solely on the systems research that is central to the sustainable intensification agenda, and particularly no specific OP for intensification of mixed crop-livestock systems.

#### **4.2 Improved Impact Assessment Methods and Data Standards**

The notion of impact evaluation/assessment has been used very broadly at ILRI, ranging from being regarded as a change in culture to very specific quantitative analyses of the impact of individual projects or OP outputs. As was noted in Section 3 this means the past activities ILRI has undertaken in this area can be viewed as anything from very broad 'approaches' to identifying possible impacts to very specific, theoretically based methodologies for measuring these impacts. This presents a challenge for making clear recommendations regarding 'methods'.

There is a wide range of circumstances when different approaches and methods can and should be used so the appropriate set for each situation is likely to be different. Yet it is crucial to have consistency within the organization; so some clear guidelines are required. Overlaying this is the fact that no systematic framework can hope to

substitute for the professional judgment by research managers. A trade-off between the cost of employing impact oriented approaches and methods and pragmatic reality always needs to be made.

The review team found that along with a broad diversity of impact assessment approaches and methods, the emphasis on each type has changed regularly. The result is mixed experience with different approaches and changing expertise of staff. These changes have been regular with no approach or method being used consistently for more than a few years. What this has meant is that none have really been given a thorough test nor, especially, have they been institutionalized within the organization.

One of the important implications of regular changing of the approach/method focus is that there has not been systematic and consistent measurement of the impact of ILRI research against the important goal of poverty reduction through improved productivity and environmental sustainability. Several good starts were made in this area using both ex ante and ex post applied welfare economics based methodology. However, this was discontinued before the expertise was fully developed and data collected to enable the analyses to be expanded to include the more complex measures of institutional change, policy change, environmental and distributional impacts. Despite many commonly expressed views to the contrary (including by ILRI staff) the measurement methodology is readily available to expand this economic analysis to cover these wider issues and it has been and is currently being undertaken in many other organizations. For ILRI it is particularly important since the impact of livestock research and especially the new focus on 'through the marketing chain' research, can have important counter intuitive negative welfare impacts on the poor. During the review it was felt that this is especially likely to be the case for several of the case study projects.

Comments from some staff during the review suggested that one of the important reasons for the shift away from welfare economics based ePIA and exIA studies was that many did not like the results and implications they were generating. It is difficult for us to be conclusive about this suggestion. However, in the case of ePIA studies there have been relatively few compared with other research organizations and the welfare gain estimates and returns on invested funds, while reasonable, were not as high as have been found for many other organizations. Some have suggested that livestock is different to crop oriented research because the impacts are more complex; however, this is not clear from other organizations, where livestock research has been shown to have attractive impacts. Focusing on the poor in Africa is difficult but again since crops are included in the same systems, livestock research does not seem to necessarily be a special case. Regardless even if the livestock systems are more complex the solution does not seem to be to shoot the messenger and resort to qualitative approaches to assessing impacts. There is little basis to expect that qualitative approaches will solve the complexity issue; rather, they are likely to avoid considering impacts systematically.

The review team found that there is a tendency in ILRI, perhaps partly due to the above, to view different approaches and methods as alternatives rather than part of an available 'tool box'. Rigorous ex post impact assessment for accountability using the applied welfare economics based methodology has been required from external demands especially the Science Council via SPIA and recommended regularly by Centre external reviews. This is the only reliable, widely used rigorous, quantitative

methodology which provides consistent money metric measures of final welfare impacts.

The review team found some reluctance by staff to continue to grasp this type of quantitative methodology as part of ILRI's impact assessment activities. However, we feel that it is important for any organization to include a systematic quantification component in any impact assessment system. Experience in many other research organizations shows that without this quantitative component many of the important counter intuitive (often negative) welfare impacts are not appreciated and therefore ignored in decision making and the learning process. As was highlighted in section 3, applied welfare economics based methodology supported by simple farm level budgeting through to, if required, more complex systems/household modeling and experimental methods is the only consistent quantitative approach available.

Within R4D projects monitoring often reduces to simple indicators, often primarily for management purposes, as well as a diversity of qualitative methods. We feel it is critical to also include quantitative methods, the most appropriate being supported by applied welfare economics as the integrating framework. This does not require development of any new methodology; the tool box is relatively full. These existing tools will need to be adapted to suit each case; this should start simply and build in complexity rather than start with using or developing new complex methods initially. However, what is required is development of a team with the correct mix of skills. As indicated earlier while ILRI did have applied welfare economics skills some time ago this expertise seems to have been diluted rather than strengthened. These skills along with the financial analysis and modeling skills also required are still available but need to be focused on this effort in an integrated approach.

These skills, applied in more ex-ante applications, can and should be used to develop and oversee a regular and consistent eplA activity, as has been recommended by past reviews and is required by the Science Council. Over time the ex ante activities will provide a comprehensive basis for future eplA activities, although this will be some time off.

**Recommendation:** That ILRI develops a consistent set of impact measurement approaches and methods which integrate the qualitative approaches of M&E for project implementation with the quantitative applied welfare economics methodology. The latter will facilitate identification of possible negative welfare effects on the poor but also consistency with completed project impact studies, which are crucial for accountability requirements.

**Recommendation:** A commitment should be made to support this integrated ex ante and ex post system for a period of at least 10 years to ensure that it is in place long enough to be fully tested and the capacity of staff developed to continue to extend the system. Sufficient core funding resources need to be allocated to this activity and the incentive system for staff needs to be adjusted to ensure the system is practical and pragmatic. Less emphasis should be placed on the development of new methods and more on adapting existing ones until the system is successfully institutionalized.

**Recommendation:** The current increase in demand by donors for simple indicators of impacts should continue to be addressed. However, they should follow as a logical subset of the data used for the above methodology to ensure that they are consistent

and logically developed within this integrated system. These should especially take into account important possible negative final welfare impacts.

The major limit to undertaking past impact assessment activities has been a reliable, systematically developed and consistent set of data. While this is the case for all impact assessment approaches and methods it is especially the case for the welfare economics based analyses. Data is one of the important constraints to being able to effectively measure institutional change, policy change and environmental impacts and especially the distributional consequences which are complex but crucial if the welfare of the poor is the driving objective, as is the case for ILRI. The experimental methods activities which are being included in recent project development activities are an important approach to provide this type of information. It is crucial to undertake a welfare economics based ex ante analysis in the development stages to ensure that all information requirements are clearly identified.

**Recommendation:** That as a crucial part of the integrated impact assessment framework ILRI includes an experimental methods component which ensures that the structure of the baseline and subsequent data collection requirements are linked to the rest of the framework, especially the quantitative applied welfare analysis.

Broader impact assessment activity which can support priority setting and strategic planning is a major issue for most research organizations. This has received considerable attention for many years and not many organizations have been successful in institutionalizing an effective support system. Most basically rely on the judgments of management and Boards, which may well be the most effective approach!

ILRI has used two different approaches in the last 10 years in this area. The first was a comprehensive 'scoring model' type quantitative/judgment approach, the second used different forms of comprehensive spatial data analysis of livestock activities and geographic indicators. The former approach was very complex and demanding on time and resources. As a result it was not followed up and institutionalized at ILRI. The latter analyses are on-going and have provided important information for guiding priorities and facilitating dialogue with partners. However, we do not believe that these activities have a clear impact orientation. Integration with an applied welfare economics based impact framework is the only way to ensure that this is included since it is the only approach which specifically measures final impacts and effectively separates price effects due to the research impacts versus those due to other exogenous effects.

**Recommendation:** The spatial analyses activities should be maintained to support priority setting and strategic planning but should also be integrated into the impact assessment system. This will ensure that all data being collected and analyzed is consistent and also that the input to priority setting and strategic planning considers and identifies any potential negative welfare impacts on especially poor groups.

### 4.3 Institutionalization of Impact Assessment within ILRI

The devolution of responsibility for impact assessment to the principal investigator or OP has been compatible with a situation where projects almost universally drive the demand for IA. In such a context application of IA is time and budget constrained, and there is little incentive or budget either to invest in ex-ante assessment design alternatives or to track future impacts of the project. However, over the review period

there has been a consistent trend toward more integrated research and organizational structures and programmatic strategies. ILRI's current initiatives to bring more strategic coherence to OP project portfolios and OP integration at thematic level is generating some demand for more explicit ex-ante impact assessment, more effective utilization and comparative evaluation of existing data, and enhanced continuity in IA methods and evaluation frameworks. The review team thus has the sense that ILRI is at the stage of wanting to give more direction to the significant resources devoted to IA within a project M&E mode within the Center. This would require in turn some reorganization in the planning, quality control, and selective standardization of IA in the Center, how that is organized and managed, and where the responsibility for such is located.

As past experience has emphasized, there needs to be an effective demand for IA and that needs to be linked to the capacity to undertake high quality IA. There is a changing demand, essentially driven by higher order program management requirements, and with potential future demands coming from the results based management framework under design for the CGIAR. How that demand is effectively articulated, linked to appropriate skills and capacity, and resourced are then organizational issues. Currently, IA functions are allocated across a number of operational units. TG01 has responsibility for targeting, RMG for data and methods used in R4D project design and for M&E, Innovation Works for managing (although not executing) eplA, and the ILRI Impact Assessment Task Force for coordinating the overall IA effort. Each of these units, except the Task Force, has responsibilities beyond just their IA activities and there is little sense of a sequential and integrated approach to IA that connects IA activities across these units. Moreover, the Task Force has only met twice and has developed little in terms of either an effective mandate or an operational modality for coordinating IA within ILRI. The increasing need for more consistent direction to R4D activities, the strategic tightening of OP and Theme research programs, and the projected increase in IA activities arising from the CG reform process all warrant moving IA to a more centralized, coordinated and integral part of the research planning, implementation and evaluation process.

**Recommendation** Folding the Systems Analysis and Impact Assessment unit into the Targeting and Innovations theme has had unintended consequences as noted in 3.6, particularly the fragmentation of eaIA, targeting, M&E, data standards, and eplA. While strengthening eaIA, at least in terms of modeling and spatial targeting, the expertise/willingness to conduct eplAs has been greatly diminished. Responsibility for IA should not rest with a Task Force, especially one which is rarely convened. Serious consideration should be given to staffing up Innovation Works, as a cross-cutting unit that would coordinate a range of activities that cut across the programs of the Center. Five different but connected activities have been discussed within this review that could come under such a program. *First* is the need for some oversight and coordination of R4D work. *Second* is the dedicated capacity for integrated IA within an economic welfare framework. *Third* is consolidation of the work on IS currently done within TG03. *Fourth* is systems modeling and spatial targeting of TG01, including its expanding program on climate change. *Finally*, there are the field protocols, survey design and data standards that come under RMG. The objective is that design would of necessity be linked to assessment and evaluation with learning feeding into the overall process. All of these five components have their own internal logic, but as well entail a range of potential synergies, all oriented to achieving and evaluating impact on ILRI's strategic objectives. How such a cross-

cutting program, potentially supported by independent units, might be designed to maximize these synergies would require more detailed thought and planning than is possible from a two week review.

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