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## Technological and Institutional Innovations for Sustainable Rural Development

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### *Abstract*

To alleviate world poverty and environmental degradation, a new approach to agricultural research is needed. The conventional research model, moving from basic to strategic to applied and adaptive research - whose products are then taken up by extension staff and disseminated, fails to address the complex local circumstances and realities of farmers and other private and public stakeholders. The new research-for-development model that is emerging focuses on enhancing the adaptive capacity of research providers and farming communities alike for 'problem-solving capability on the move'. It incorporates into the research/innovation process participatory approaches, multi-scale analysis and intervention, systems analysis and information management and impact assessment. Being more socially accountable than traditional research models, the process involves many partnerships engaging users throughout in order to identify research needs, mobilise resources, conduct the research and evaluate the outcomes.

The Africa-based International Livestock Research Institute (ILRI) and its many partners conduct research at the intersection of livestock and poverty. Keeping livestock helps half a billion poor people in developing countries to secure assets, and thus provides a pathway out of poverty. This paper examines ILRI's strategic response to the changing environment in which international research is being carried out. Focal research areas and paradigms are both changing. ILRI has reorganised its research into five interlinked themes to implement a revised strategy that emphasises innovation systems, participatory research, a strengthened social science capacity, partnerships and interdisciplinary teamwork.

ILRI is committing itself to a socially distributed knowledge system, where research is conducted always within the context of application and with the imperative of poverty-alleviating knowledge products present from the start of the innovation process. To produce a stream of innovative, creative, demand-driven and competitive knowledge products has required that ILRI reorients its culture from traditional supply-driven disciplinary science to demand-driven community-based transdisciplinary scientific applications.

**Keywords:** Research themes, research-for-development model, transdisciplinary scientific applications

This presentation seeks to discuss the ways in which research is changing to encompass a more participatory, demand-oriented paradigm. In the research for development continuum, scientists must view their disciplinary contributions to innovation as being but one part of the complex linkage or web which involves many actors at many different stages and levels in order to deliver an impact-oriented output.

The example of ILRI's pour-on tsetse fly control method in Ghibe, Ethiopia is indicative of a successful technical innovation which controlled the tsetse fly in a certain location over a period of many years. The innovation, however, failed to involve important stakeholders at various stages of development, and to elicit feedback from the farmers themselves and examine the intervention in terms of the social livelihood context or circumstances in which it was designed. Once ILRI stopped subsidizing the pour-on, farmers could no longer afford to apply it to their cows. The innovation was therefore unsustainable and the tsetse fly returned to the area.

This paper examines how the linear paradigm of basic to strategic research, leading to extension and diffusion of innovations does not address poverty effectively because it does not embrace the circumstances and realities of farmers and other public and private stakeholders. In addition, and perhaps most crucially, it does not allow for feedback at the early stages of development and is not participatory at all stakeholder levels therefore ensuring research is relevant and socially applicable.

What kind of paradigm does effective research need to embrace?

The main difference between conventional reductionist theories surrounding and a more innovative approach is that problem solving in the former is carried out following the codes of practice relevant to a particular discipline and problem solving in the latter is organized around a particular application.

ILRI has recently revised its strategic direction to incorporate more holistically the principles of a "learning institution" and a more demand driven, output-oriented perspective. This revision responds also to significant drivers of change that are occurring on a global scale, such as globalization, population growth and income growth.

With these drivers of change and the evolving environment in which research must be conducted, ILRI has developed a conceptual framework in which pathways out of poverty and interrelated strategic research themes have been identified which will contribute towards a common objective of poverty alleviation and will form the basis of ILRI's work to 2010.

These research themes are:

**Targeting Opportunities** – how can livestock contribute to pathways out of poverty

**Enabling Innovation** – how can adoption of livestock and agriculturally related innovations be accelerated?

**Market Opportunities** – how can the poor access the benefits of emerging livestock markets?

**Biotechnology** - How can livestock biotechnology best be used for development?

**People, livestock and the environment** – how can livestock livelihoods make a larger contribution to human and environmental well-being?

Research carried out in the context of these themes will be multi-disciplinary, involve many stakeholders, be participatory and encourage feedback at all levels of design and implementation,

and be impact-oriented. What follows are two examples of interventions and research that has been developed with many partners for a more sustainable impact.

ITM ECF example

Antigen-based ECF vaccine example

Conclusion