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NATIONAL AGRICULTURAL RESEARCH ORGANISATION

Integrated Agricultural Research for Development
Achievements, Lessons Learnt and Best Practises

"Creating the economic, organizational, and service delivery conditions for farmers' profitable investment in new technology"

CONFERENCE BRIEF

Entebbe, Uganda, 1-4 September 2004



Internet address:
www.naro.go.ug

Editors:
D.J. Rees and M.P. Nampala

The list of participants, speeches, synthesis and papers presented at the workshop can be accessed on the CD enclosed in this conference brief.

Integrated Agricultural Research for Development– Achievements, Lessons Learnt and Best Practises. Kampala, Sept 1-4 2004.

"Creating the economic, organizational, and service delivery conditions for farmers' profitable investment in new technology"

CONFERENCE BRIEF

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Foreword

Africa is currently in crisis - hunger and poverty are major threats , yet agricultural productivity is low and the population is steadily increasing. Effective investment and development in roads, education, health and agriculture is urgently needed to achieve the Millennium Development Goal of halving the number of people living in poverty by 2015. Investments in agriculture have been shown to be one of the most effective ways to improve the livelihoods of poor people, giving higher returns to investment than the other sectors. Agriculture constitutes the main source of livelihoods of the poor; provides over 50% of all employment in Africa; provides the largest contribution to GDP, is the main source of foreign exchange and is the main generator of savings and tax revenues.

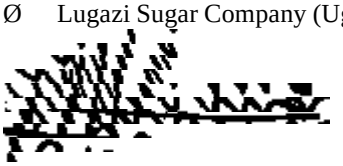
Agricultural research plays a crucial role in the agricultural development, economic growth and poverty eradication in our countries – through the generation of productivity and income enhancing technologies with which the poor can leverage out of poverty, and with which nations can achieve agricultural and economic growth and development.

Uganda's National Agricultural Research Organisation has an impressive record of developing improved agricultural technologies to-date. In line with Government's increased focus on poverty eradication, NARO too is re-aligning itself towards greater emphasis on development-oriented agricultural research, with increasing focus on client-orientation, response to farmer-demand and to market opportunities. The new strategy and plan integrates bio-physical research into the dynamics of the systems in which consumers of research outputs sustain their livelihoods. It involves understanding people and the innovative processes that mitigate undesirable environmental and social impacts; recognizes the need to adopt approaches for trans-disciplinary and multi-stakeholder participation to ensure relevance, efficiency and effectiveness; links producers to markets and to industry; and addresses policy and institutional concerns. Finally, it aims at generating technologies that are relevant to the needs of the Ugandan farming population and the market.

This conference was an important milestone in NARO's realignment process; enabling us to review achievements to-date together with our colleagues, identify gaps and key areas for improving our research efforts in integrated agricultural research for development (IAR4D) in the future.

The conference was organised and implemented by several teams drawn from NARO and Makerere University, I am therfore particularly grateful to the following for their efforts: L. K. Serunjogi, D. Rees, M. Osiru, P. Nampala, J. Okello-Onen, F. I. Oumo, T. E. Areke, R. Kirkby, K. Odongkara, J. Aluma, E. Twinamasiko, M. Tenywa, J. Okorio, A. Bua, C. Ebong, J. J. Hakiza, P. Lusembo, S. Kiwanuka, W. Odogola, E. Adipala, J. Guina and D. Kyetere. I also gratefully acknowledge the assistance in terms of skills, staff-time and finances from the following organisations:

- Makerere University;
- African Highlands Initiative;
- UK DFID Client-Oriented Agricultural Research & Dissemination Project;
- Centro Internacional de Agricultura Tropical (CIAT);
- UK DFID Crop Protection Program;
- International Food Policy Research Institute (IFPRI);
- World Bank;
- Rockefeller Foundation;
- Danish International Development Agency;
- Danish Institute of Agricultural Science
- World Agroforestry Centre (ICRAF);
- Forum for Agricultural Research in Africa ;
- World Association of Soil & Water Conservation
- Lugazi Sugar Company (Uganda) Ltd



Dr. John R.W. Aluma
For Director General, NARO

Table of Contents

Integrated Agricultural Research for Development 1

Theme 1: Understanding people, their livelihood systems, demands and impact of innovations to advance development 2

Theme 2: Enhancing innovation processes and partnerships 4

Theme 3: Enhancing integrated management of natural resources -synthesis of international developments and state of the art 6

Theme 4: Technological options that respond to demands and market opportunities with focus on crops and livestock 8

Theme 5: Enabling policies and linking producers to markets 10

Integrated Agricultural Research for Development (IAR4D)

As agriculture becomes increasingly liberalized and commercialised, public research systems are having to embrace wider goals of poverty reduction and environmental preservation, as well as serving a wider variety of clients (policy makers, environmental groups, consumers, *etc.*), all demanding greater participation in the research process. Attempts by public research and development (R&D) to address these new challenges include institutional pluralism and partnerships in delivering research services, competitive allocation of public (R&D) resources (currently accounting for over 12% of all agricultural research funding worldwide; and mechanisms to strengthen links with stakeholders. Uganda is currently revising its national agricultural research system to meet these changes, and in common with other research organisations, has identified development themes currently challenging agricultural research. The five interlinked themes challenging research in Uganda are:

Theme 1: Understanding people, their liveli hood systems, demands and impact of innovations to advance dvelopment;

Theme 2: Enhancing innovation processes and partnerships;

Theme 3: Enhancing integrated management of natural resources;

Theme 4: Technological options that respond to demands and market opportunities;

Theme 5: Enabling policies and linking producers to markets.

The overarching challenge is to develop an integrated agricultural research system that focuses on addressing these challenges, or "integrated agricultural research for development" (IAR4D). As part of its re-alignment to address these challenges, the Uganda National Agricultural Research Organisation (NARO) hosted an international conference to review experiences to-date in implementing integrated agricultural research for development, and to document best practise guidelines. Documentation of the proceedings was organised in collaboration with the Uganda Journal of Agricultural Sciences. Over 120 papers from 10 countries were accepted for publication, and key points and lessons synthesized from them by a team of international leaders in research on each theme. This brief provides a summary of the key points from the syntheses[1].

In the keynote address Dr. J. Lynam (Rockefeller Foundation) reviewed recent trends leading to the recognition that agricultural research needs to re-align to address development challenges, and proposed a mission statement for integrated agricultural research for development that captured most stakeholders' understanding of the concept:

"Creating the economic, organizational, and service delivery conditions for farmers' profitable investment in new technology"

Agricultural research has to consider a much broader agenda than hitherto, participating in the creation of platforms that integrate institutions and functions to directly address the issues of integrated agricultural research for development. Farmer empowerment, partnerships with other organisations with complementary skills, and increased equity and market focus are the core issues of integrated agricultural research for development (Figure 1).

The papers reviewed in the conference have demonstrated that technological options (Theme 4) only form part, albeit a critical part, of the solutions to poverty reduction and environmental preservation. The relatively non-globalised state of African agriculture presents all development stakeholders (scientists, farmers and development agents) with challenges at a number of levels. Themes 1, 2 and 5 papers discussed on the clients of research, partnerships and processes which can improve adoption of new technologies and market opportunities. In addition productivity improvements must take place in cropping systems with degraded soils and which face periodic drought-the main issues covered by Theme 3. By linking the five research themes for the new NARS, the integrated research approach should be greater than the sum of its parts because it will ensure that research addresses farmers' problems and provide sustainable solutions and opportunities which can be readily taken up by them.

The meeting provided an excellent opportunity to discuss the components of an integrated research system for development under the five themes and to look at ways for implementing effective integrated systems. The submitted papers clearly demonstrate that new research partnerships are developing and that integration between sectors is taking place within agricultural research systems. The lessons learnt can be used to strengthen the effectiveness of existing technological options and to improve the development of new options in the future. However it should be remembered that agricultural biological and biophysical systems are not static and farmers are continually faced with emerging constraints, many of which are poorly understood.

[1]The reader is strongly recommended to study the syntheses themselves, to appraise the full details and implications, and to gain a full understanding of the best practise recommendations resulting from the conference

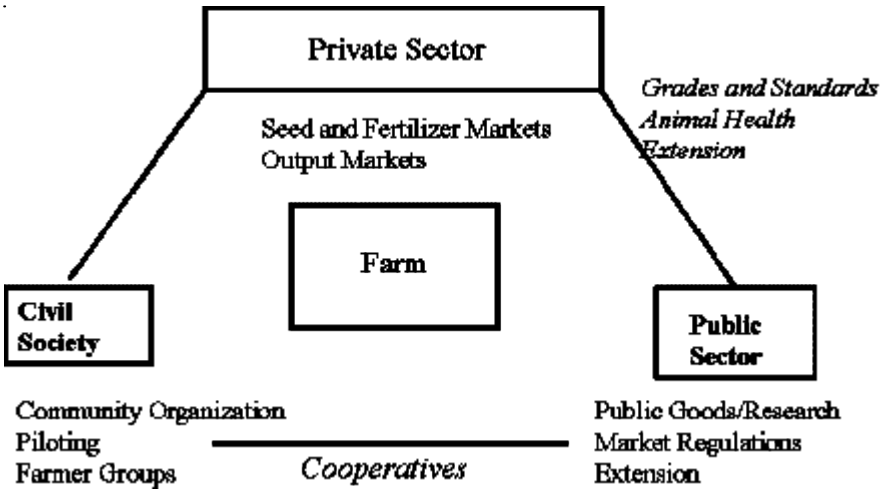


Figure 1. Interacting Public, Private, Civil Society Partnerships for Integrated Agricultural Research for Development

Even where some understanding exists, the lack of policies or political will hinder up take of research findings and key recommendations. The threats to humankind posed by climate change and the erosion of biodiversity are just two examples which will have global as well as local impacts. In addition the development and adoption of new technological innovations are accepted by the global community as essential instruments for solving resource problems. This must be recognised before suggesting that adequate technologies have been developed. Research managers and policy makers must be aware, therefore, that although in some cases, further/ better promotion of existing technologies may indeed be necessary to reduce poverty, it is also vital to ensure that further research into new technologies is also funded.

All of the indicators in the submitted papers describe the benefits or outcomes of research as enhanced productivity or improved incomes. However, some of the dimensions identified by the poor include voicelessness, isolation and vulnerability; the eradication of which requires more of institutional change than just increases in income. In many cases, research can empower the poor through increasing their access to decision-making processes and reducing their vulnerability to economic shocks via asset accumulation. Agricultural research that leads to improved technologies can also benefit the poor through greater physical and economic access to crops that are high in nutrients and crucial to the well-being of the poor - particularly poor women. Should development of more nutritious and safer foods therefore be a key part of the modernisation of Agriculture? Should we be thinking of amending "conventional" research indicators to reflect more 'intangible' impacts such as improved health or greater participation in decision-making as a result of agricultural technology development?

The papers and syntheses provide an extremely valuable reference point for the current state of integrated agricultural research for development; and present a wealth of experiences illustrating best practises, pointing out potential pitfalls, and identifying key areas for further research and development. The papers and thematic synthesis were published in volume 9 isuue 1 of the Uganda Journal of Agricultural Sciences. In this conference brief we present highlights of the the thematic presentations[2]

Theme 1: Understanding people, their livelihood systems, demands and impact of innovations to advance development.
Synthesised by A. Stroud

NARO's goal for **"***Understanding people, their livelihood systems, demands and impact of innovations"* (Theme 1) is "to generate and ensure utilisation of accurate information and knowledge on the people and their livelihoods in designing research interventions." The contribution of this theme (referred to as 'diagnostics' for simplicity) to the research process is traditionally seen as falling at the beginning and end of the research sequence. However, knowing that research is a continuous process with iterative, sequential steps or stages, the contribution of diagnostics is actually throught the process, and results are informative not only to researchers but to many stakeholders. Figure 2 illustrates the multiple inputs of diagnostics into research and innovation.

[2] The synthesis are presented in volume 9 issue 1 of the Uganda Journal of Agricultural sciences

Papers and the synthesis of theme 1 consider recent changes in diagnostics approaches and procedures, from commodity and farming systems to livelihoods analyses and impact assessment. Advantages, disadvantages and implementation challenges of different approaches presented in the papers are reviewed and analysed, and the implications of new directions in diagnosis and assessment for IAR4D are highlighted in the synthesis. Major trends reviewed include: the increased use of participatory methods and social learning processes in research; increased use of more comprehensive, integrated systems and livelihoods approaches; the improved blending of R&D to now become R4D and the increased attention to research processes; and the increased importance of amalgamating and negotiating demand and the associated expansion of the methods and tools.

The identified outputs indicators and impact for theme 1 are indicated in (Box1). Also identified are the following key features and principles for diagnostics that will be needed if researchers and their organizations are to achieve the outcomes envisioned for IAR4D:

- Use of a participatory social and experiential learning paradigm to guide the operational process (in contrast to a prescriptive or blueprint approach),
- Orient monitoring systems towards an iterative 'reflection and learning' approach,
- Consider scaling up pathways and chains of partners throughout so as to identify and have early inclusion of stakeholders and their institutions,
- Improve innovation and adaptive management capacity so as to generate and make use of a wide range of technological options successfully applied to different niches
- Promote the use of integrated, holistic farm and landscape systems management principles and work on interactions at the systems level (e.g. water x soil/land x pest/disease/weeds x genetic resources)
- Develop and test strategies for amalgamating and negotiating demand;
- Develop priority-setting procedures that are both rigorous and balance the interests and needs of relevant stakeholders;
- Integrate impact assessment in monitoring
- Empower stakeholders to strengthen collective and individual decision making, analysis, planning and implementation, lobbying, negotiation and conflict management;

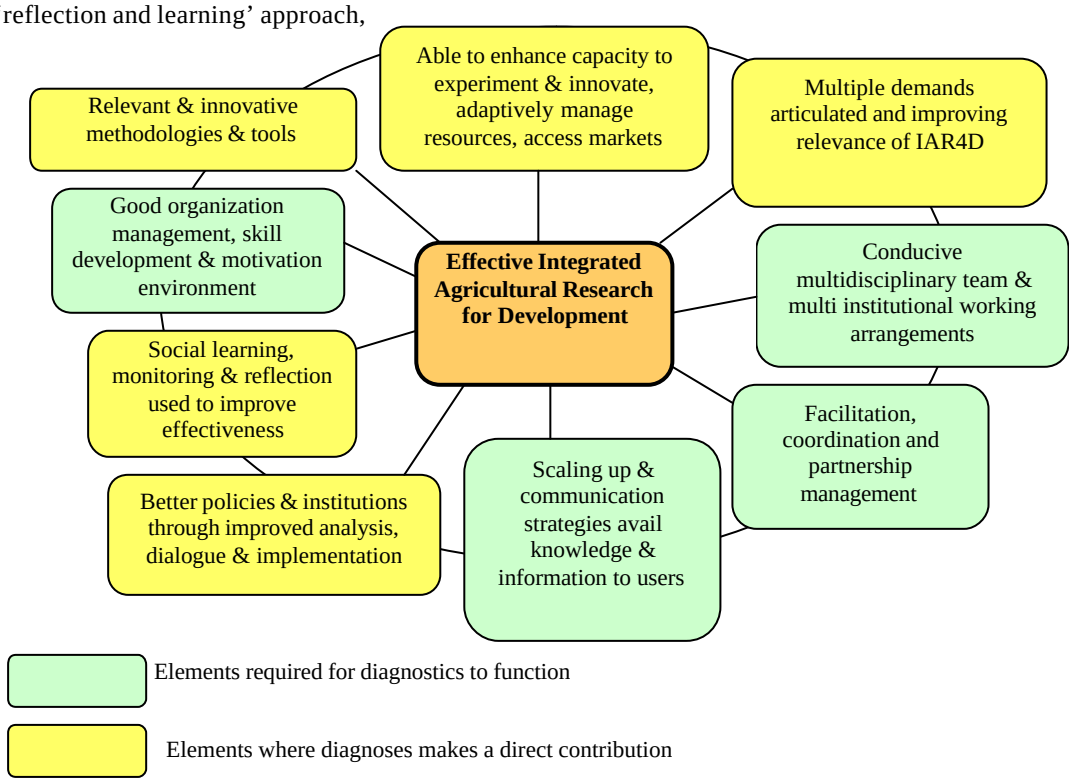


Figure 2: A conceptual diagram illustrating the multiple inputs of diagnoses into the research innovation system

Box 1: Outputs, indicators and impact for Theme 1: Understanding people, their livelihood systems,demands and impact of innovations

Outputs

- Biophysical, natural resource and socio-economic (demand and market-driven) opportunities and challenges within peoples' agricultural systems identified and understood at various levels;
- Interactions between systems components understood;
- Peoples' constraints, opportunities and demands identified and prioritised
- Research relevance, efficiency, accountability and impact to clients increased

Indicators

- Descriptive database of information on biophysical and socio-economic status of the people
- Information on the interaction between systems components
- Lists of prioritised constraints, opportunities and demands
- Client-endorsed research programme incorporating researchable issues identified and agreed with stakeholders

Impact

- Greater integration of research into the broader national development agenda
- A focused research agenda addressing priority needs and concerns of stakeholders

Theme 2. Enhancing innovation processes and partnerships. Synthesised by: *S. Kaaria, R. Kirkby, R. Delve, J. Njuki, E. Twinamasiko and P. Sanginga*

Rural innovation is "the process by which various stakeholders generate, adapt or adopt novel ideas, approaches, technologies or ways of organizing, to improve on- and off-farm activities, so that the rural sector becomes more competitive in a sustainable manner". Serious attention to empowering farmers is indispensable to improving the relevance, effectiveness and efficiency of current research for development systems. Key components of innovation processes are summarized as: Farmer experimentation; Strengthening human capital; Strengthening social capital; Enhancing access to information; Linking local knowledge to scientific knowledge; Strengthening partnerships; Scaling up innovation processes; and Strengthening changes in formal sector institutions to support innovation processes.

Participation" between researchers, farmers, extensionists and other stakeholders is central to the concepts of innovation. The expected outputs, indicators and impact from this theme are presented in Box 2. Achievements lessons learnt and best practice guidelines for implementation in the application of participatory approaches arising from the papers presented to the conference are reviewedin the synthesis; (1) in priority-setting; (2) in supporting farmer experimentation; (3) in approaches to extension; and (4) in successful examples of impacts. Some lessons and best practises emerging from the review of papers are:

- The term PRA is overused and has little useful meaning anymore – *"the devil is in the detail of the methodology as it is applied"*. The issue of cost is not addressed in most research undertakings an important limitation given the perception that participatory research is slow and increased costs involved.
- Innovation systems should offer end-users "baskets of options" of technologies. not general technological recommendations, even if honed to different farmer typologies. The concept of farmer typologies, and of social and gender differences in general is very important however – if the opportunities and constraints of different end-users, especially poorer groups, are not taken into consideration from the outset, it is likely that the "basket of options" will be incomplete – especially in options for the poor and women.
- Linking participatory research to market opportunities is likely to greatly increase impact, but needs to be implemented sensitively with respect to equity and gender issues.
- Working with farmer groups generally is more cost-effective than working with individuals, provided that appropriate methods are used. Working with established groups has more often than not proved to be more successful. Farmers' organizations are growing in strength and importance, and could rapidly become valuable partners in innovation systems.
- Development and uptake pathways for a technology should be defined right from the start of a research project.
- Ensuring that information from research is translated into forms useful for farmers and is conveyed effectively to the users should be integrated into every project and become the responsibility of every researcher and program leader.
- There needs to be awareness of the needs and limitations of a technology, and researchers need to be prepared to catalyze some initial arrangements through partner institutions rather than leaving this as a "policy" issue.

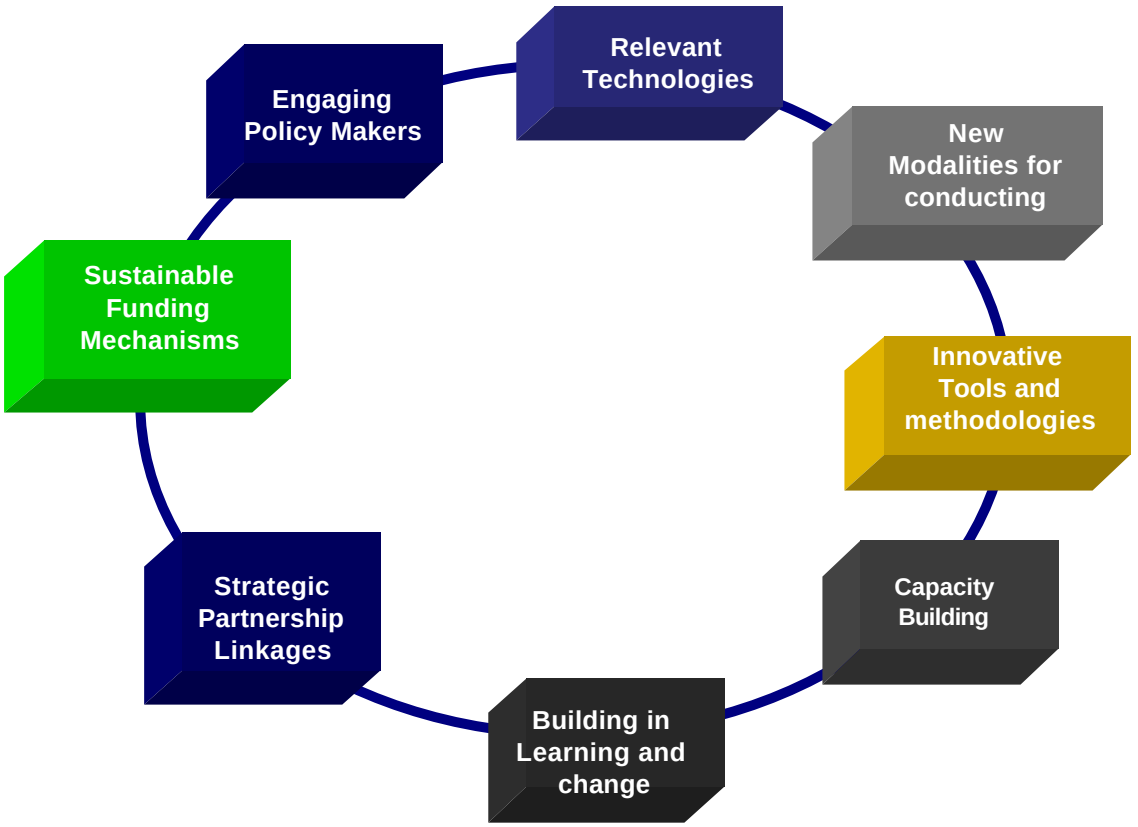


Figure 3: Elements for effective scaling up/out innovations and sustaining the process

Box 2: Outputs, indicators and impact for Theme 2: Enhancing innovative processes and partnerships

Outputs

- Methods and approaches for management and delivery of technical information services developed
- Methods and approaches for enhancing institutional linkages and establishing strategic partnerships developed
- Methods and approaches for biophysical and socio-economic research developed

Indicators

- Number and types of information management and delivery methods and approaches in use
- Number and types of methods and approaches for enhancing institutional linkages and partnerships in use
- Number and types of methods and approaches for biophysical and socio-economic research in use
- Types of clients and stakeholders involved in NARO research
- Number of joint programs implemented
- Innovative institutional approaches and methodologies for demand-led research identified and in use

Impact

- Increased adoption of technologies
- Increased productivity and profitability
- Improved competitiveness of products

- The separation of roles between NARIs, development agencies and farmer organizations are likely to become less distinct. While NARI scientists need to be directly involved in scaling-out, they need to seek out and work with development partners with whom they can scale-up and therefore achieve much wider impact (Figure 3).

- Concern for outcomes will contribute to a more enabling environment for the creation of partnerships. However, the wider environment contains both competitive and complementary forces, and the successful institutions will be those that are ready to give up some control and share credit for success in order to achieve greater goals.
- Empowering farmers to reach their potential requires investment, which generally should be the responsibility of development agencies, formal extension, NGOs and, increasingly, of farmer organizations themselves. However, even many NGOs and their staff still have much to learn about how best to do this, and NARs scientists have an important role in developing, monitoring, learning and promoting these processes.
- Capacity building for understanding farming and social systems, collaborating with farmers and working across innovation systems is an urgent step. All scientists will need the ability to understand and work in teams with other disciplines, and many more scientists than at present need skills in communication and facilitation and other participatory tools.
- Incentive systems for agricultural scientists remain problematic in many countries, yet developing and working within a dynamic innovation system demands retention of the best brains and the utilization of some of the accumulated experience to help guide field teams. The director who guides research, rather than administers it, should become a more common phenomenon.

Theme 3: Enhancing integrated management of natural resources -synthesis of international developments and state of the art. Synthesised by: *F. Place and J. Okorio*

A simple conceptual framework to show how natural resources are linked into production or other transformation processes at different scales (Table 1). Four key aspects of natural resource management (NRM) are highlighted: scale; externalities, context specificity, and trade-offs. Natural resource management (NRM) operates across a variety of spatial and temporal *scales*; and in fact must try to integrate results from different scales to properly conceive cause and effect relationships. Closely related to scale issues is the concept of *externalities* – positive or negative consequences that a behaviour or action by one person or in one location may have on other persons or other locations; or the effects of resource use today on resource users of future generations. Failure to account for externalities is likely to lead to sub-optimal NRM investment. The context specificity of most research must also be taken into consideration – the extent to which research carried out in one small area can be generalised to larger scales.

The concept of tradeoffs is particularly central to NRM – weighing the benefits of natural resource use against any detrimental effects – identifying win-win situations, reducing negative effects of interventions or finding combinations of interventions that can produce win-win or win-neutral results.

Achievements and gaps are discussed for management of soils, water, trees, forests and fisheries, and an overview of the natural resource management that addresses issues of integration across resources, property rights, and conflict resolution is provided. The following achievements in the area of INRM research were noted:

- Advancement of tools for studying natural resources;
- Integration of indigenous knowledge into NRM research;
- Improved empirical knowledge of how natural resource systems work, how they are related to each other, and how they respond to management;
- Development of practical NRM techniques

Successful integrated natural resource management (INRM) projects are discussed, and the main principles for developing successful INRM drawn out:

- Creation of short-term interest and commitment
- Clear partnerships built on trust
- Cross-disciplinary teams of research and development
- Enabling governance and policy
- Local organizational capacity for collective action
- Innovation and feedback processes
- Access to information
- Effective research design
- Shared problem and opportunity focus
- Effective facilitation and coordination
- Explicit strategy to scale up and out

Many “gaps”, or areas where research is still needed, are noted, and several recommendations to address these were made:

- To develop and practice an ex ante impact assessment system. A sound framework will subject all major research directions and possibly individual

projects to the test of generating productivity, income, or environmental impacts. As such, the ex ante impact assessment needs to embrace the notion of market oriented research, as recommended by several of the papers presented to the theme.

- Clearly identify clients for research, and develop strategies for translating research results into useful materials for each client group.
- Pay greater attention to formulation of research questions, hypotheses, site selection,research methodologies, and data management, so that results from different pieces of research can be linked and generalized beyond site specificity.
- Pay careful attention to the integration of market orientation into the research agenda, especially with regard to issues of scale.
- Give consideration at the outset, to the tradeoffs between working intensively with relatively few communities over long periods of time *versus* more extensive short-term coverage.
- Review and consider the roles of researchers and development partners, to maximise the comparative advantages of each actor involved.

The various outputs, indicators and impacts of theme 3 are summarised in Box 3.

Table 1: Conceptual Framework of Resource and Use/Production Linkages

	Resource Inputs	**Farmers/ Processors/ Resource users**	**Outputs – Impacts on Resources**
Farms	Soils Rainwater Irrigation Trees	Crops cultivation Milk Fruit harvesting/ processing	Soil fertility and erosion Water table and salinity
Off-Farm	Grazing land Lake and stream water Firewood collection Thatch Wild foods Medicines	Charcoal burning Cooking Construction – repair Domestic water use Fishing	Deforestation Vegetative cover Biodiversity – commons lands Hydrological flows and watershed functions
Theme outputs	Harnessing natural resource products	Commercialization	Mitigate adverse environment effects

Box 3: Outputs, indicators and impact for Theme 3: Enhancing intergrated management of natural resources

Outputs

- Strategies for harnessing and commercialising natural resource-based products developed and disseminated**.**
- Strategies for mitigating adverse environmental effects developed and disseminated

Indicators

- Inventories on biodiversity and its potential.
- Number and types of technological packages for developing and utilising natural resource-based products demonstrated, adopted and being applied
- Number and types of technological packages for utilisation of renewable energy sources demonstrated and adopted
- Number and types of technological packages for mitigating adverse environmental impacts demonstrated and adopted
- Type of partners involved in the process of generating technologies.
- Number of stakeholders with access to information about the technologies

Impact

- Reduced losses due to adverse environmental and human effects
- Enhanced natural resource productivity
- A cleaner and healthier environment
- Improved social stability

Theme 4:Technological options that respond to demands and market opportunities with focus on crops and livestock. Synthesised by: ***F. Kimmins, M. Vaarst, C.Ebong, N. Halberg, J. Hindhede K. Albright and A. Ward***

Technology development is a core area of agricultural research, and the increasing global focus on client-demand and market opportunities is intended to increase the relevance and effectiveness of technology development. The review of papers for this theme focuses on the achievements of and lessons learnt from technological options developed for crop and livestock systems including breeding, management practices and processing. Where as other themes focus primarily on the technology development process, the outputs of the this theme focus on appropriate technologies, knowledge, information and methods that enhance productivity, value addition and the competitiveness of the products in both national and international markets (Box 4). The papers demonstrate that agricultural researchers have and are continually developing a broad range of technological options to secure the production of safe food and non food cash crops and to achieve the most efficient and ecologically sound use of natural resources; soil, water and energy. The papers also demonstrate a diversity of research providers as well as public sector bodies such as national agricultural systems and universities, non-governmental organisations which have links to broad farmer networks and have become increasingly involved in research activities. Those organisations with a network can test options under a wide range of conditions and where promising recommendations emerge, their linkages can permit research recommendations to be rapidly scaled up. It is also apparent from these papers that farmers want packages of information-not just pest management strategies alone but a total package including other aspects such as soil and weed management options. Achievements, gaps, lessons and best practise guidelines emerging from the papers are listed below:

Achievements

- Many technologies are available, which farmers can choose from, and some of which can help the poor.
- Research has been moved nearer to end users, and researchers are responding to market demands. Product quality is Increasingly becoming a focus of research, largely as a result of increased attention to market linkages
- Increasing evidence of participatory approaches at the planning stage, where target groups are involved.
- Increasing trend to integrate gender and poverty issues
- Increasing use of multidisciplinary approaches and pluralistic provision of research services.
- Increasing use of a range of partnerships with other actors, from an increasing wide range of stakeholders, and farmers becoming increasingly organised.
- Major constraints to crop and livestock production have been identified and are continually being addressed

Gaps

- The poorest communities or members of communities appear to have limited access to current technologies. Many dissemination processes do not allow the poor to access them. Some are too expensive.
- The response time to farmers' demands are too slow, and there is little acknowledgement of the fact that farmers' and market's needs are very dynamic. Generally, NARS capacities are insufficient in human resources and infrastructure to effectively respond to emerging issues, leading to long time lags in information dissemination, technological generation and publicity.
- Market linkage research needs further strengthening, and there is limited participation of the private sector in technology development.
- The demand system of most farmers is still relatively weak.
- Dissemination of research results is generally poorly managed, and there are few examples of effective scaling up of technologies
- Researcher understanding of gender issues and how to incorporate these into technology development processes is still weak.
- Indigenous technologies poorly researched.
- Socio-economic inputs to technological research are still relatively weak.
- Measurement of impact of processes and partnerships are missing.

Lessons learnt

- Adoption is increased by market research, smallholder consultation, use of better pathways *e.g.* schools, and when working with end users.
- Need to understand people before generating and disseminating technologies; underlying demands are not always understood or interpreted correctly.
- Technologies must be affordable, and working in groups may help the poor to access expensive technologies
- The "Basket of Options Approach" should be increased, and technologies should be appropriately packaged.
- Policy development is slow, and there is a need to review policy on certification of technologies.

Best practices

- Partnership approaches to technology development are vital, but there must be clear definition of roles, and matching expertise with roles. Strong leadership is required.
- Relevant stakeholders should be involved, and NGOs should be facilitating stakeholders.
- Consolidation and strengthening of multidisciplinary approach.
- Proper risk assessment framework of biotechnological products for safety assurance (mostly related to discussion in crop research)
- Resource mobilisation and rational resource utilisation
- Effective communication of researchresults and technologies to all stakeholders.

Box 4: Outputs, indicators and impact for Theme 4 Technological options that respond to demands and market opportunities

Outputs
- Technological options that increase productivity of crops, livestock, fisheries and forestry resources developed and promoted
- Technological options that optimise quality, broaden utilization base and enhance marketability of agricultural products developed and promoted
- Appropriate farm power, tools and equipment that optimise production and processing developed and promoted

Indicators
- Technological options that increase productivity of crops, livestock, fisheries and forestry resources in use
- Technological options that optimise quality, broaden utilization base and enhance marketability of agricultural products in use
- Appropriate farm power, tools and equipment that optimise production and processing in use
- Increase in proportin of clients using technology/ innovations
- Proportion increase of area under new technology
- Total production with new technologies
- Value of production per unit (harvested area, animal unit, etc)
- Value added in the pre- and post-harvest sector
- Cost of production

Impact
- Increased agricultural productivity
- Increased food security
- Improved efficiency of production and utilisation systems
- Increased incomes at household, community and national levels

Institutional implications / policy issues

- Funding flow should change with structural changes.
- Private sector should be included in research. National Agricultural Research Systems should institutionalise private sector partnerships as well as the participation of farmers, NGOs and other GOs.
- Implementation of policies that promote smallholder investment.
- Infrastructure should be improved in rural areas to ensure effectiveness of technologies.
- Harmonized patenting system is needed. National Agricultural Research Systems need policies to promote incentive for innovation in terms of recognition, not just financial, but also promotion.
- Better collaboration between partners and research institutions is necessary. There is need for structures that facilitate partnerships. Partnerships should benefit the smallholders.
- Need for domestic policies in order to be able to compete on international markets.
- Capacity building in information and communication, including research outputs to policy makers.
- Need to promote a food chain approach in research programmes which encompasses disciplines *e.g*, a "*farm to fork*" research programme or a "*fork to farm*" approach if market issues are critical.

Theme 5: Enabling policies and linking producers to markets Synthesised by*: S. Benin*

The aim of the synthesis is to provide suggestions for best practices for agricultural policy and market research that can lead to effective policy formulation and institutional development, and enhance competitiveness and market access of smallholder producers (Box 5). Research finding from Uganda and elsewhere are drawn upon, and so the synthesis is applicable to other developing countries. Many developing countries have been implementing economic reforms, leading to rapid growth. Adoption of market liberalization policies, in addition to heavy farm subsidies in industrialized countries, has resulted in a situation of domestic markets being exposed to a highly competitive global market. Thus, appropriate policies that enhance the competitiveness of smallholder producers in developing countries are key to catalyzing and deepening the progress of agricultural and economic transformation and poverty eradication. The synthesis reviews what is meant by "policy research" and by "competitiveness", and summarises recent achievements and gaps, lessons learnt and best practises for policy research to develop enabling policies and link producers to markets. Policy research is a process aiming at change, the demand for which derives from the demand for institutional change to improve the status quo. Figure 4 outlines the stages of the entire process, which are further discussed in the synthesis.

The application of the term "competitiveness" to a country or region (as opposed to corporations and businesses) is discussed, and the seven "steps to competitiveness" identified by the Services Industry Branch of Industry Canada are presented as a useful tool for policy researchers in assessing all aspects of competitiveness (Figure 5). Each of the steps to competitiveness is examined in the synthesis, highlighting the achievements and gaps of research in putting them on the policy agenda. The achievements, gaps, lessons learnt, best practices and implications for institutional development from the papers which covered broad areas of policy advocacy to enhance competitiveness and information mechanisms for research and adoption of technologies are:

Achievements*:*

- Access to market information
- Improved access to credit
- Technologies
- Partnerships and collective actions enhanced
- Researchers involved with policy committees (PMA committees)
- Policy makers involved in research process that lead to policy recommendations
- Market opportunities analysed (principal mechanism has been stakeholder workshops)
- Market systems information available on commodities, quantities, prices & markets
- Mechanisms through training farmers in interpretation and utilisation of market information

Gaps:

- Levels (micro, meso and macro)
- Ugandan information inadequate
- Not enough policy briefs from research
- No follow-ups on policy recommendations

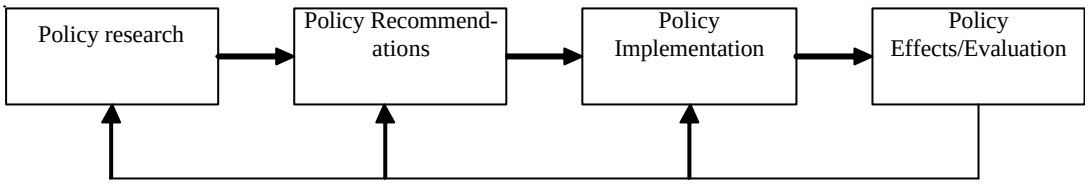


Figure 4. Policy research process

- No follow-ups on workshop recommendations
- Findings deal more with export crops
- Inadequate coverage in commodities, markets
- Local market opportunities not promoted
- Information does not provide for commodity grades
- Policies passed without full discussion
- Weak policy implementation and information
- Little information on value addition
- Inadequate dissemination
- Insufficient action research

Lessons learnt

- Need for empowering and strengthening farmer marketing groups
- Need for partnerships
- Caution in reviving co-operatives

Best practices

- Policy gaps to be clearly identified prior to research design
- Existing policies should be fully researched before making policy recommendations
- Compare with other policy recommendations, build on them
- Recommendations should be based on research at the level at which the policy is required
- Involve policy makers/stakeholders at all levels of research
- Researchers to be involved in policy committees (eg PMA)
- Researchers to be actively involved in lobbying

Best practices - Methodologies:

- Policy change cycle framework
- Market structure, conduct and performance analysis
- Demand, supply and price analysis
- Transactions cost analysis
- Market simulation models (IFPRI's IMPACT AND DREAM Models)
- Institutional economics
- Impact assessment
- Case studies
- Market opportunity identification
- Cost-benefit analysis
- Risk assessment
- Farm budget analysis

Implications for institutional development

- Partnerships in funding, capacity and data sharing among research institutions
- Networking and linkages for information and data sharing
- Build human and analytical capacity
- Multidisciplinary teams for policy and marketing research and policy dialogue
- Dynamic strategy development, in response to changing market opportunities
- Improve organisational capacity of farmer groups

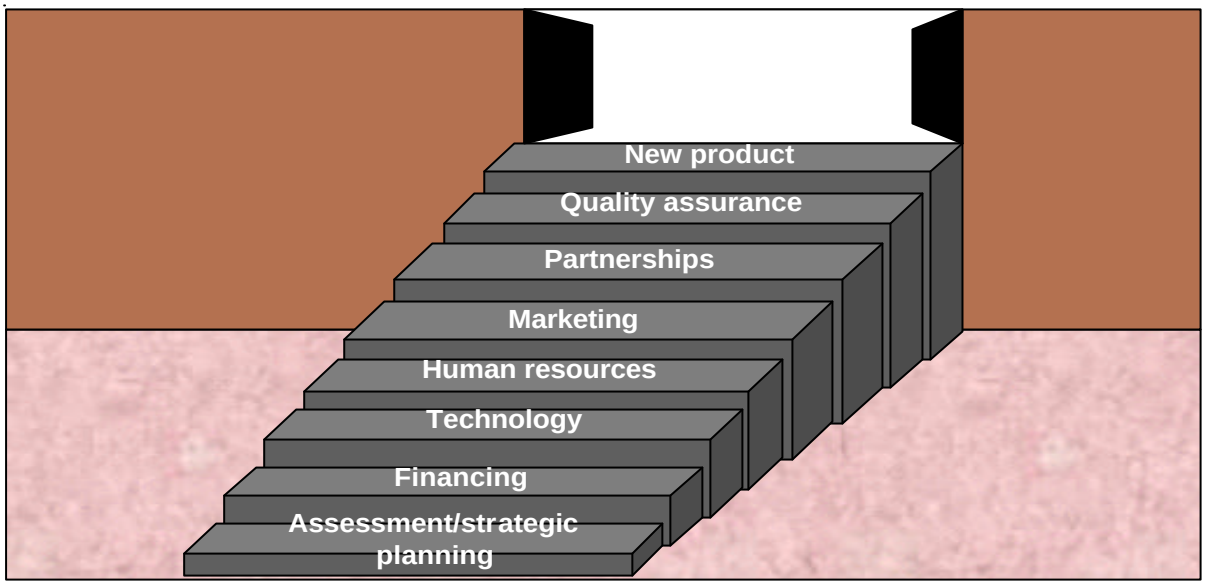


Figure 5: Steps to competitiveness (SIBIC 2003) - adapted from website of strategis.gc.ca

Box 5: Outputs, indicators and impact for Theme 5 Enabling policies and linking producers to markets

Outputs

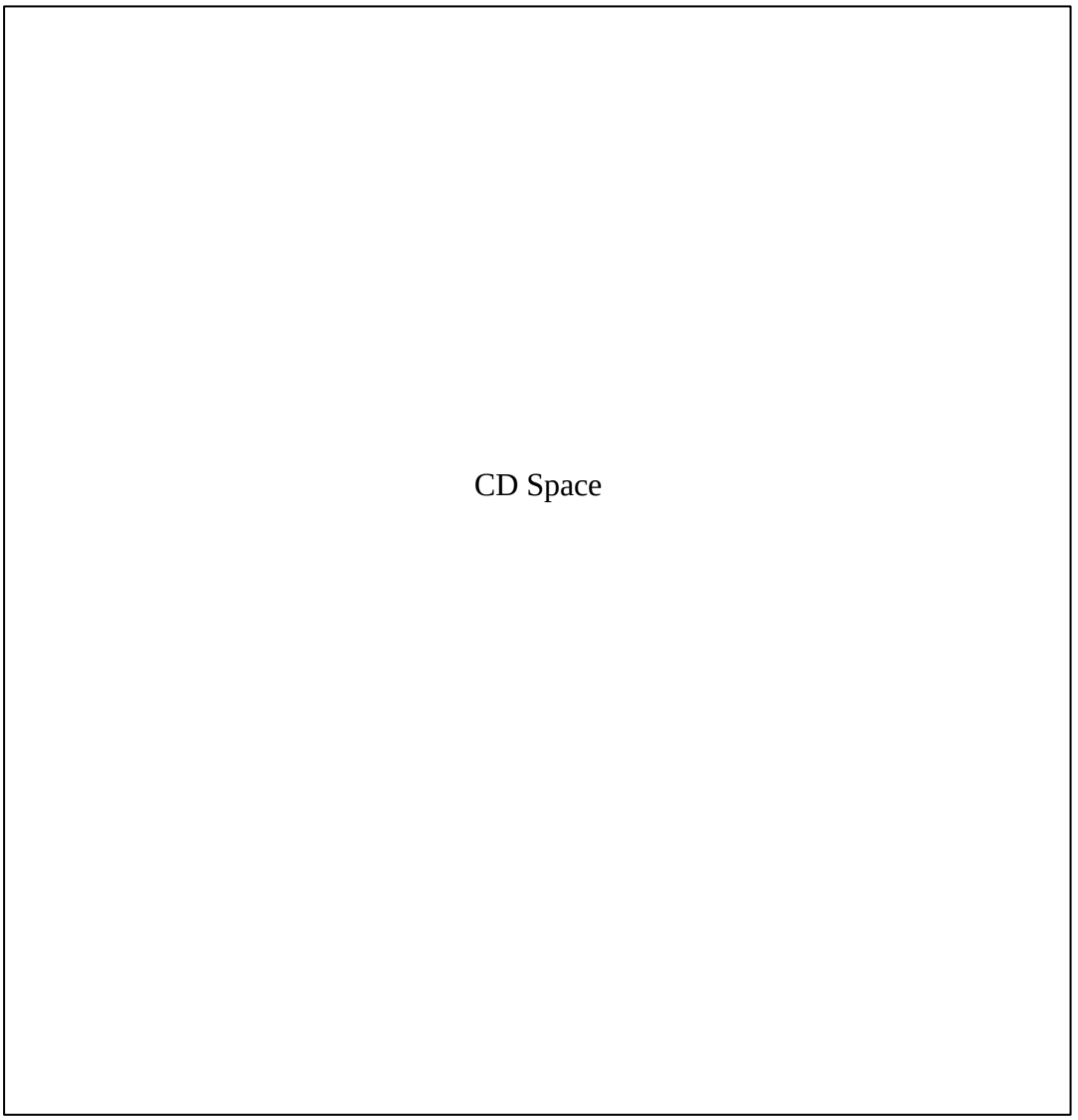
- Recommendations for formulation of policies that enhance competitiveness provided
- Policy options availed to key stakeholders
- Enhanced policy advocacy
- Information and mechanisms that lead to improved response and access to market opportunities by researchers and producers generated and disseminated

Indicators

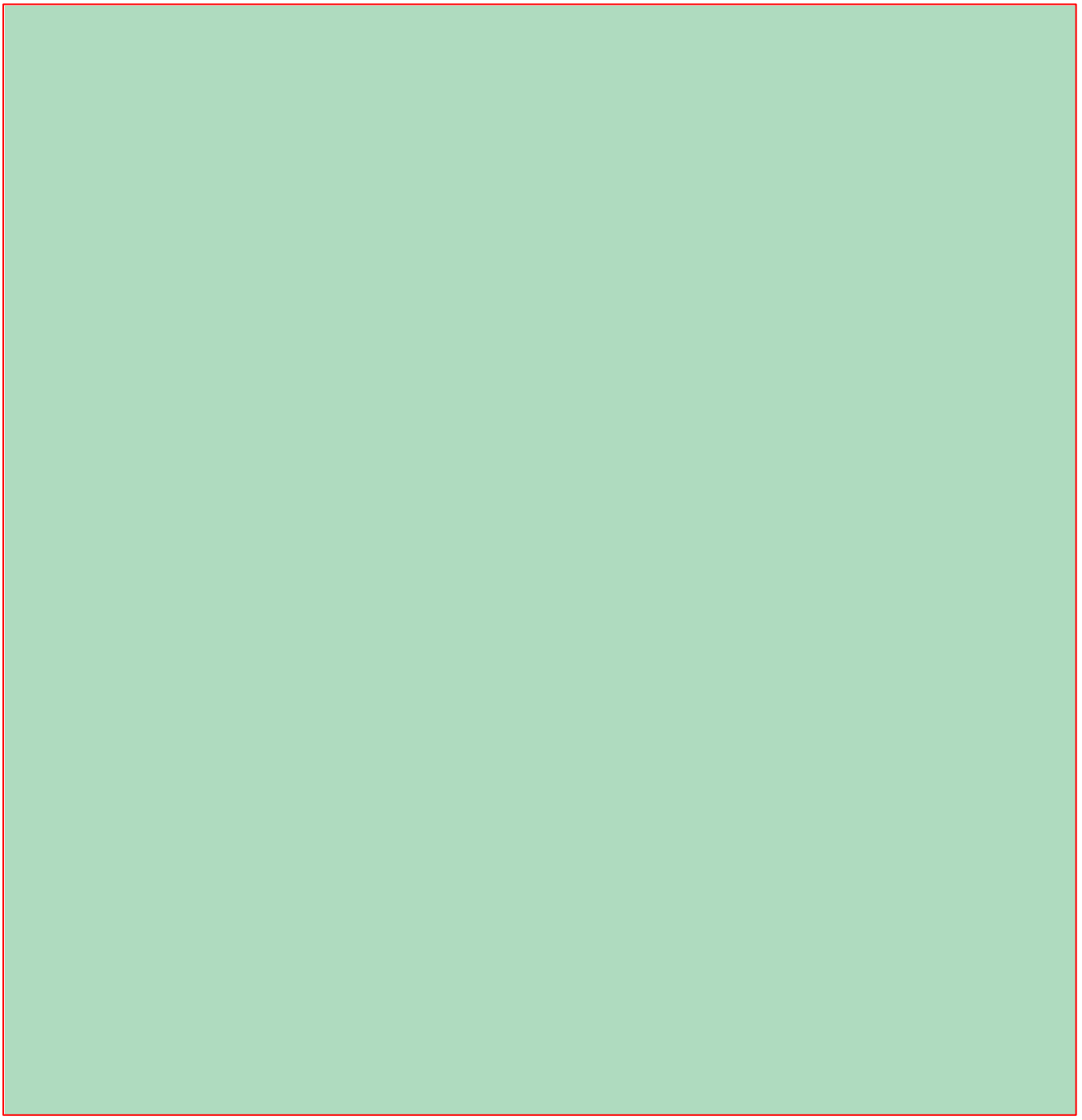
- Analyses of policies that influence agricultural development
- Number and type of policy options being considered by interest groups
- Number and types of for a for policy dialogue
- Number and types of coalitions built for shared policy objectives
- Number of documented studies and pilot experiences on market opportunities, dynamics and requirements

Impact

- Improved policy formulation process
- Conducive policy environment for agricultural development
- Better understanding, ownership and implementation of policies
- Farmers effectively producing for local and international markets
- Market information integrated in research and development



The list of participants, speeches, synthesis and papers presented at the workshop can be accessed on the CD enclosed in this conference brief.



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