



Research and Science Quality Policy
Version 4

Effective Date: May 1, 2019

Document Control

The Head of Knowledge Management Unit will be responsible for the periodic review of this document.

Document Responsibility

Title	Research and Science Quality Policy
Directorate	Research
Unit	Knowledge Management Unit
Manager	Head of Knowledge Management Unit
Applicable to	All ICRAF staff and partners

Document Revision History

Version	Endorsed By	Meeting Reference	Date Endorsed	Approved By	Meeting Reference	Date Approved	Effective Date	Sections Modified
1	Senior Leadership Team	n/a	n/a	Board of Trustees	n/a	1-Apr-93	1-Jan-94	New Policy Guideline on "Enhancing research quality at ICRAF" (No. 1) by Pedro A. Sanchez
2	Senior Leadership Team	n/a	n/a	Board of Trustees	BOT54	n/a	2011	Revised Policy Guideline on "Science quality"
3	Senior Leadership Team	SLT-SI-11-14	16-Oct-14	Board of Trustees	BOT60-D30	26-Nov-14	27-Nov-14	Revised policy on "Research and science quality"
4	Senior Leadership Team	SLT-SI-02-19	19-Feb-19	Board of Trustees	ICRAF69-D17	27-Apr-19	1-May-19	Reformatted and revised policy

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1. Purpose

- 1.1. The World Agroforestry Centre requires that its research and the science that underpins or results from this research are of the highest quality. This Policy frames the principles and concepts that will support achievement of this goal.
- 1.2. The Centre's vision an equitable world where all people have viable livelihoods supported by healthy and productive landscapes. It's mission is to harness the multiple benefits trees provide for agriculture, livelihoods, resilience and the future of our planet, from farmers' fields through to continental scales.
- 1.3. The Centre's research and development (R&D) activities strive to satisfy the following five core criteria:¹
 1. **Novel:** Aimed at new findings;
 2. **Creative:** Based on original, not obvious, concepts and hypotheses;
 3. **Uncertain:** Uncertain about the final outcome;
 4. **Systematic:** Planned and budgeted;
 5. **Transferable** and/or **reproducible:** Lead to results that could be possibly reproduced.
- 1.4. In order to drive our research towards measurable outcomes and impacts ICRAF requires all its projects to test one or more of the following three types of hypotheses, which are:
 1. **Theories of change understanding:** A family of hypotheses that revolve around explanations of how the world and its problems are changing in order to focus research on areas that are most likely to be amenable to the kind of change that would deliver the desired outcomes and impacts.
 2. **Theories of place:** Hypotheses related to the way geographic, biophysical, social or economic contexts affect our ability to deliver desired development impacts, and consequently what might be done about this.
 3. **Theories of intervention success** (or induced change): Hypotheses that lay out the impact pathways between investment and expected outcomes – the plausible causal links that justify making research (or development) interventions in the ways proposed.
- 1.5. The Centre recognizes that to adequately combine the research and development components to accelerate impact it needs to better frame its work around both research hypotheses and/or development hypotheses. The intention is to frame the research and development hypotheses

¹ OECD (2015). *Frascati Manual 2015: Guidelines for Collecting and Reporting Data on Research and Experimental Development*. Paris: OECD Publishing.

around one or more of the six key domains of productivity, profitability, environmental sustainability, social inclusion, good governance and sound management.

- 1.6. Within this overall hypothesis-framed approach, ICRAF considers the principles and concepts stipulated here as the basis for research and science quality. Our concept of science quality is based on the generation of credible, legitimate and salient knowledge that meets international academic standards across all relevant scientific disciplines. However, academic standards alone are insufficient to meet the expectations and needs of intended users and beneficiaries. We therefore extend the concepts and principles beyond those used in academia.
- 1.7. To derive the best utility from agroforestry interventions it is considered best to design and implement research for development that accepts that we are dealing with complex adaptive systems. This requires research to be embedded within development investments and interventions that are prepared to 'learn as they do', in order speed up adaptation and lower the risks of failure. The results are better development investments and improved responsiveness on the part of practitioners and implementers alike.
- 1.8. The Centre is committed to research excellence and science quality that upholds the highest standards of intellectual rigor, data management and access, transparent and honest reporting of results and integrity in recognizing the intellectual properties of others.

2. Scope

- 2.1. This is a Centre-wide Policy and is applicable to all staff located in all countries where the Centre operates.
- 2.2. Responsibilities for ensuring quality of research and science, as stipulated here, are distributed over all organizational dimensions of our Centre.

3. Definitions

- 3.1. **Agroforestry:** The practice and science of the interface and interactions between agriculture and forestry, involving farmers, livestock, trees and forests at multiple scales (Source: ICRAF *Corporate Strategy 2017-2016*).
- 3.2. **Applied research** is original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific, practical aim or objective (Source: *Frascati Manual*. Paris: OECD, 2015).

- 3.3. **Basic research** is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view (Source: *Frascati Manual*. Paris: OECD, 2015).
- 3.4. **Credibility** involves the scientific adequacy of the technical evidence and arguments.²
- 3.5. **Experimental development** is systematic work, drawing on knowledge gained from research and practical experience and producing additional knowledge, which is directed to producing new products or processes or to improving existing products or processes (Source: *Frascati Manual*. Paris: OECD, 2015).
- 3.6. **Legitimacy** reflects the perception that the production of information and technology has been respectful of stakeholders' divergent values and beliefs, unbiased in its conduct, and fair in its treatment of opposing views and interests.²
- 3.7. **Research** and **experimental development** (R&D) comprise creative and systematic work undertaken in order to increase the stock of knowledge – including knowledge of humankind, culture and society – and to devise new applications of available knowledge (Source: *Frascati Manual*. Paris: OECD, 2015).
- 3.8. **Salience** deals with the relevance of the assessment to the needs of decision makers.²
- 3.9. **Scientific and technological activities** (STA) can be defined as all systematic activities which are closely concerned with the generation, advancement, dissemination and application of scientific and technical knowledge in all fields of science and technology (Source: *Frascati Manual*. Paris: OECD, 2015).

4. Policy Statement

- 4.1. The basic principles of good science, as currently understood and described here, are to be read in the context of ICRAF's Corporate Strategy and the ICRAF Business Model, which describe the four main categories of work the Centre undertakes in terms of (1) discovery research; (2) hypothesis driven research; (3) evidence based development at scale; and (4) advisory services:
 1. **Discovery research:** Developing theories; upstream biophysical, social, laboratory, analytical and modelling research, and innovation.

² Cash, D. W., Clark, W. C., Alcock, F., Dickson, N. M., Eckley, N., Guston, D. H., Jäger, J., & Mitchell, R. B. (2003). Knowledge systems for sustainable development. *Proceedings of the National Academy of Sciences*, 100 (14): 8087-8091. DOI: 10.1073/pnas.1231332100

2. **Hypothesis driven research:** Testing hypotheses in a formal way and with established or novel scientific methods.
3. **Evidence based development at scale:** Using options and context to design and implement scaling up and scaling out programs.
4. **Advisory services:** Knowledge customization and application, development advice.

4.2. These four work categories relate to the Centre's value propositions as well as the CGIAR Strategic Results Framework (SRF) and the CGIAR Research Programs (CRPs).

4.3. Science and research are fundamental to all four work categories and hence the principles described here apply to activities that contribute to any of these categories. The ICRAF corporate strategy, the ICRAF Business Model, and this policy do not draw a distinction between activities that are research-based and those sometimes colloquially described as "development" within the Centre. "Development" actions fall within work categories three and four, and the science and research embedded in them has the same requirements for high quality.

4.4. ICRAF positions its agroforestry science so as to influence action on policy and practice relevant to the Centre's strategic goals and the CGIAR's SRF. Research that is effective at spanning the boundaries between knowledge and action requires understanding that spans disciplinary, epistemological and experiential divides. The research must comply with basic quality criteria but in addition researchers need appreciation of the relevance and function of the boundary, and make specific efforts to help ideas and knowledge move across in a two-or more-way exchange. This requires attention not only to the credibility of the scientific endeavor but also its salience (which can be interpreted as relevance and global importance) and legitimacy.

4.5. As stated in the Centre's Corporate Strategy, high quality research at the World Agroforestry Centre recognizes the diversity of contexts within which agroforestry action takes place and the influence context has on useful policy and practice options. At the same time, we continually seek understanding of widely applicable mechanisms and processes. It is the combination of understanding of contexts and mechanisms that determines outcome potential that is realized through effective communication with stakeholders for accelerated impact.

4.6. High quality research at World Agroforestry Centre adheres to the following 12 principles:

4.7. Context (Legitimacy) aspects:

1. It is built on understanding of local (including analog and contrasting) contexts from multiple perspectives (geographic, environmental, biological, social, gender, cultural, historical, economic and political).

2. It is responsive to local and national needs, acknowledging multiple stakeholders and their knowledge, expectations, ambitions and interests.
3. It is set within clear boundaries of the systems we and our partners study or have mandate in, while recognizing relations with a broader context.

4.8. Mechanism (Credibility) aspects:

4. It contributes to long term research goals that exist beyond short-term project objectives and planned deliverables.
5. It is about processes that are applicable in multiple contexts.
6. It is framed by a clear conceptual framework that defines the boundaries and focus of exploration, problem definition, hypotheses, models and research questions.
7. It challenges current understanding, exploring new contexts for testing mechanisms and contributing to new thinking.
8. It uses rigorous and repeatable methods: protocols, peer reviews, valid and efficient design and analysis, verifiable data.
9. It is flexible, taking advantage of unanticipated results, stopping fruitless avenues of research and experimenting with new ones.

4.9. Outcome (Salience) aspects:

10. It is planned with identified outcomes and a strategy for reaching them, while not ignoring unplanned opportunities.
11. It is planned with communication and use as part of the design.
12. It is designed to meet policy needs at different scales, from local to global.

5. Roles and Responsibilities

- 5.1. The Centre will provide a working environment and culture which allows and encourages all staff to work towards high quality science.
- 5.2. Staff must be familiar with the principles. Those planning and implementing programs and projects are responsible for ensuring principles are embodied in all work.
- 5.3. The Centre will monitor its adherence to the principles and periodically evaluate their effectiveness through monitoring of appropriate metrics.
- 5.4. Staff members responsible for establishing research partnerships will ensure that research in the partnership is consistent with the principles. We will not work in partnerships that do not allow compliance with the principles.

5.5. The Senior Leadership Team will develop mechanisms for implementing the policy and make them available through a regularly updated procedures and guidelines to achieving and monitoring research quality, which will include definitions of key terms and metrics for monitoring research and science quality.

6. Review

6.1. This policy will be reviewed every three years or earlier if required by the Research Methods Group.

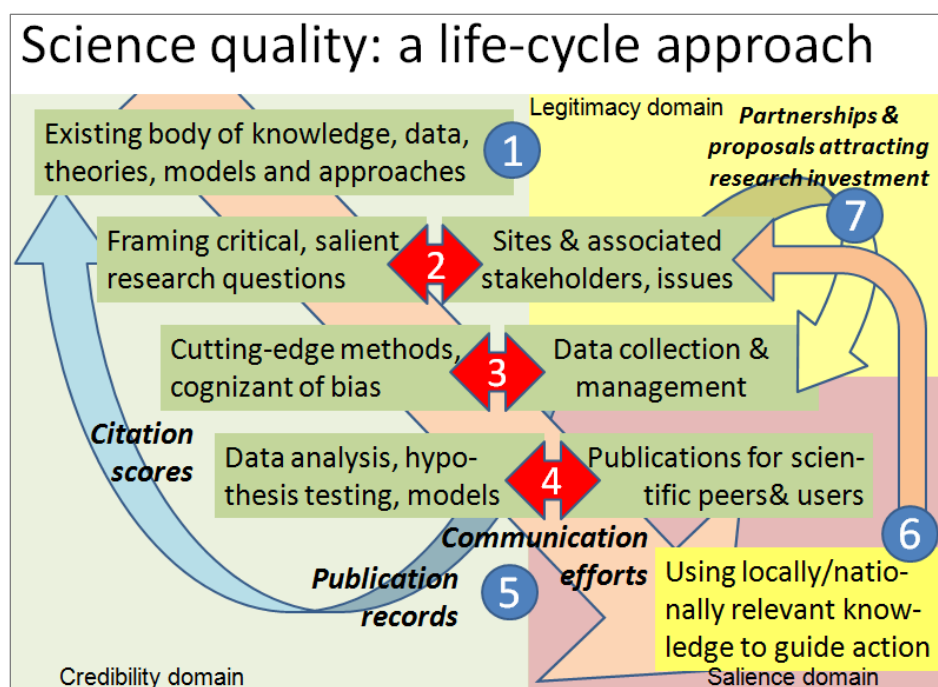
6.2. Any changes made to the Policy will be presented to the Senior Leadership Team for endorsement and thereafter submitted to the Board of Trustees for approval.

7. Related Documentation

- 7.1. ICRAF Corporate Strategy 2017-2026
- 7.2. ICRAF Business Model
- 7.3. Research Ethics Policy
- 7.4. Research Misconduct Policy
- 7.5. Fraud Prevention, Monitoring and Response Policy
- 7.6. Local Knowledge Policy
- 7.7. Research Data Management Policy
- 7.8. Personal Data Protection Policy
- 7.9. Invasive Alien Species Policy
- 7.10. Tree Genetic Resource Policy

8. Annexes

- 8.1. Life cycle approach to science quality (Source: ICRAF *Science Quality Policy*, 2011)



- 8.2. ICRAF four main work categories and relationships to the CGIAR Strategic Results Framework (SR) and our value propositions (Source: *ICRAF Business Model*, v1.1, April 2018)

Category of Work		% of our agenda	Description	Part of SRF and reported in CRPs	Relationship to ICRAF Value Propositions				
					Evidence & Analyses	Technical, Social, Policy and Finance Solutions	Design, Decision, Delivery Options	Networking, Convening, Partnerships	Accelerating Impact
1	Discovery Research	15%	Developing theories; upstream biophysical, social, laboratory, analytical and modelling research, and innovation	All	***	**	*	*	*
2	Hypothesis Driven Research	40%	Testing research hypotheses in a formal way and with established or novel scientific methods	All	***	**	*	**	*
3	Evidence-based Development at Scale	25%	Using options and context to design and implement scaling up and scaling out programmes	Some	**	***	***	***	***
4	Advisory Services	20%	Knowledge customisation and application, development advice	None	*	***	***	*	**