MULTIDIMENSIONAL DIGITAL INCLUSIVENESS INDEX

Innovating how inclusiveness is measured in digital agri-solutions

CGIAR | DIGITAL TRANSFORMATION | SUSTAINABLE FARMING | GENDER EQUALITY AND INCLUSION



The technology accelerated the inequality it was meant to solve.

THE HAVES

The wealthiest, most connected users

- ✓ High-speed internet
- ✓ Speaks the dominant dialect
- ✓ Digital literacy
- ✓ Already has the infrastructure

THE HAVE-NOTS

The people the tool was actually for

- ✗ No reliable connection
- ✗ Speaks a local dialect
- ✗ Never taught data privacy
- ✗ Choosing between a data plan and food

WHO STAYS HARDEST TO REACH

Women · Youth · Smallholders · Low-connectivity regions · Indigenous users · Elderly users · People with disabilities

Without a structured way to see who a tool serves and who it doesn't, scaling decisions rely on intuition.

THE PROBLEM OF DIGITAL INNOVATION

Inclusiveness = inclusion + inclusivity.

→ INCLUSION · STRUCTURAL REALITY

The hardware. The network coverage. The existence of the app.

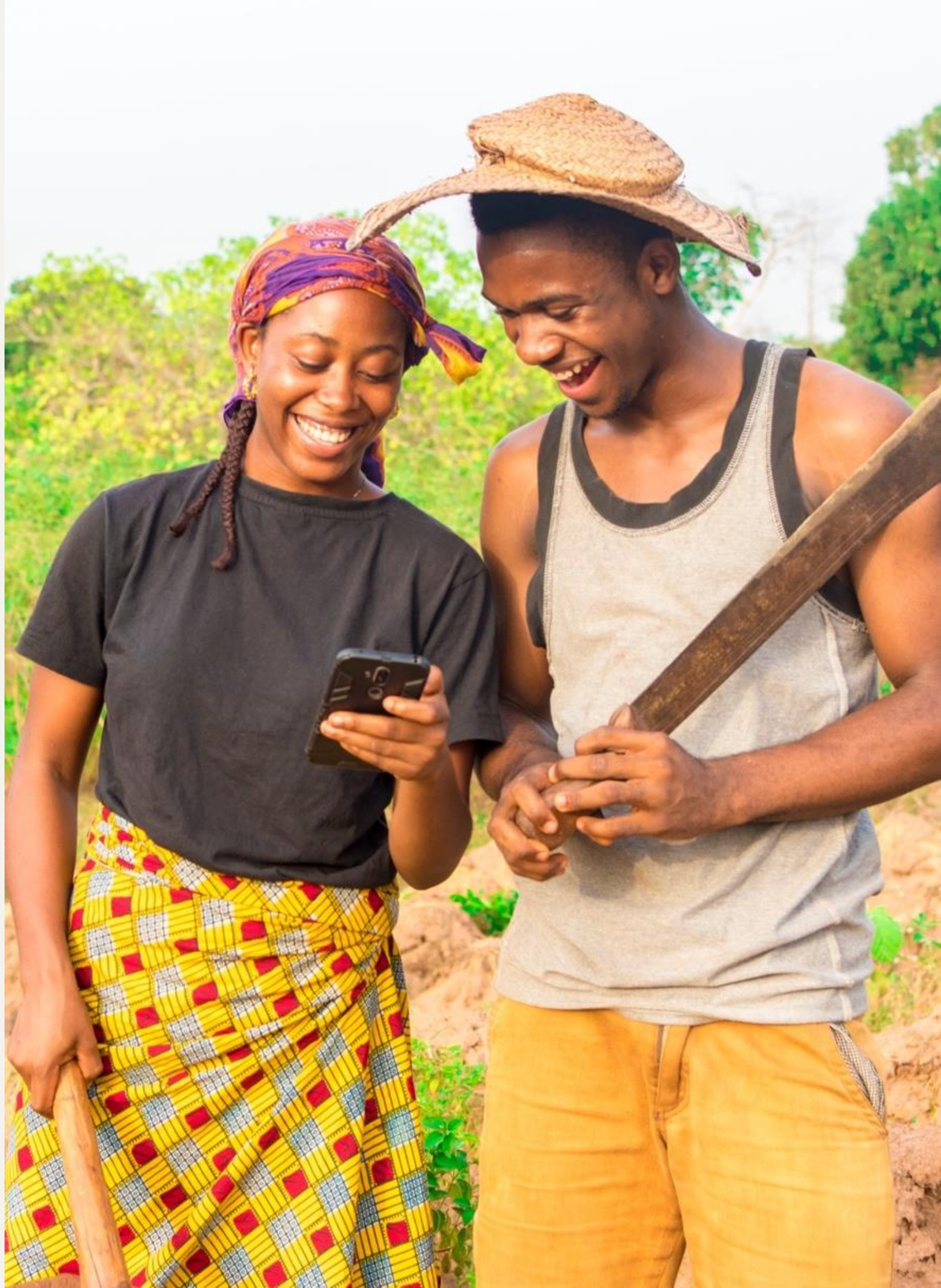
“Do resources physically exist to include users?”

→ INCLUSIVITY · EXPERIENTIAL REALITY

The user's real, functional engagement with the tool and how they feel included in the development process.

“Do users feel included in the development lifecycle?”

CGIAR DIGITAL TRANSFORMATION SUSTAINABLE FARMING GENDER EQUALITY AND INCLUSION



A tool for human-centric innovations.

MDII is a diagnostic tool that looks at how inclusive digital agri-solutions are for (underrepresented) groups. More than a score, it shows where innovations can be improved.

It delivers a prioritised, mostly low-cost plan to act for the inclusion of all.

An end-to-end outputs.

A combination of AI-based technologies and conventional evaluation techniques.

Assessment pathways

1

Complete Assessment

End-to-end platform: user panels, multi-language surveys, automated reporting, recommendation repository.

2

Fast AI-based Assessment

A chatbot that uses AI personas to deliver a preliminary inclusiveness reading before a full evaluation.

Results

3

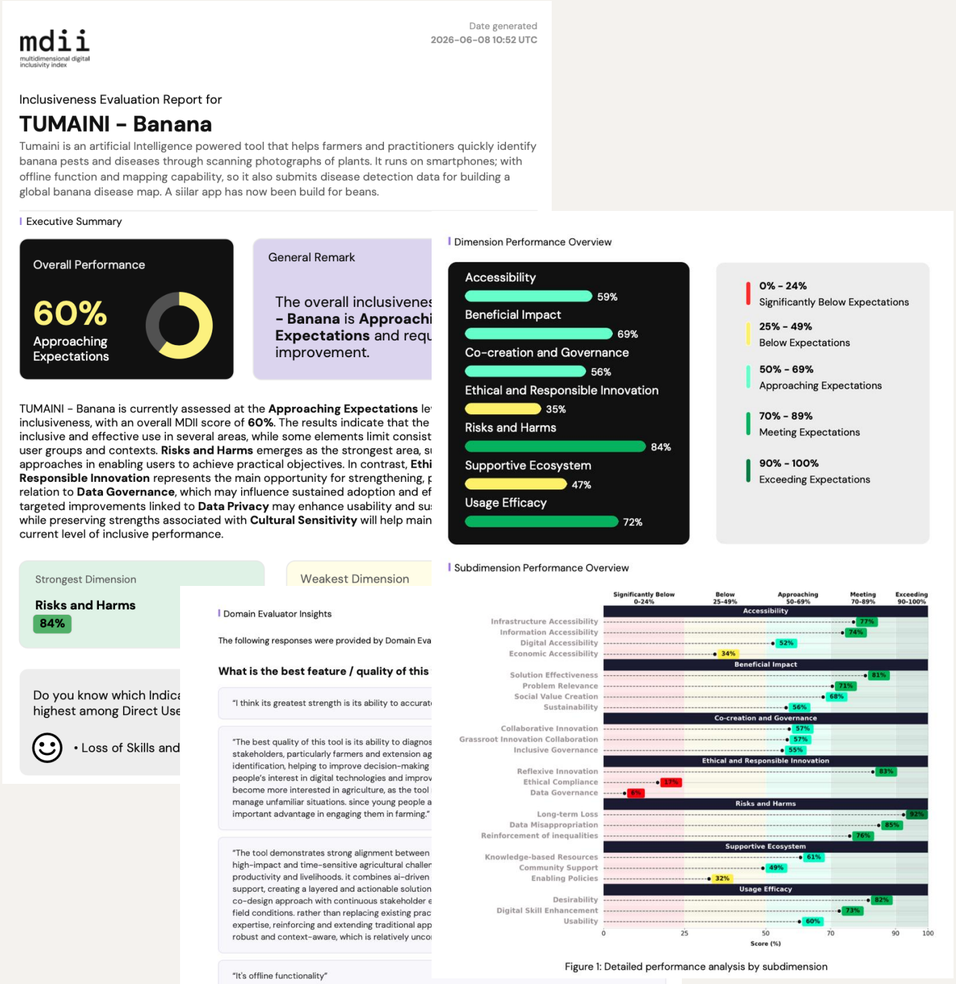
Results and recommendations

An online view to compare scores across tools and explore dimension and indicator breakdowns.

4

Visualization

An online view to compare scores across tools and explore dimension and indicator breakdowns.


mdii
multidimensional digital inclusivity index

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Inclusiveness Evaluation Report for

TUMAINI - Banana

Tumaini is an artificial Intelligence powered tool that helps farmers and practitioners quickly identify banana pests and diseases through scanning photographs of plants. It runs on smartphones; with offline function and mapping capability, so it also submits disease detection data for building a global banana disease map. A siilar app has now been build for beans.

Executive Summary

Overall Performance

60%

Approaching Expectations

General Remark

The overall inclusiveness - Banana is Approaching Expectations and requ improvement.

Dimension Performance Overview

Accessibility 59%
Beneficial Impact 69%
Co-creation and Governance 56%
Ethical and Responsible Innovation 35%
Risks and Harms 84%
Supportive Ecosystem 47%
Usage Efficacy 72%

0% - 24% Significantly Below Expectations
25% - 49% Below Expectations
50% - 69% Approaching Expectations
70% - 89% Meeting Expectations
90% - 100% Exceeding Expectations

TUMAINI - Banana is currently assessed at the **Approaching Expectations** le inclusiveness, with an overall MDII score of **60%**. The results indicate that the inclusive and effective use in several areas, while some elements limit consist user groups and contexts. **Risks and Harms** emerges as the strongest area, s approaches in enabling users to achieve practical objectives. In contrast, **Ethi Responsible Innovation** represents the main opportunity for strengthening, p relation to **Data Governance**, which may influence sustained adoption and ef targeted improvements linked to **Data Privacy** may enhance usability and su while preserving strengths associated with **Cultural Sensitivity** will help main current level of inclusive performance.

Strongest Dimension

Risks and Harms

84%

Weakest Dimension

Subdimension Performance Overview

Significantly Below 0-24% · Below 25-49% · Approaching 50-69% · Meeting 70-89% · Exceeding 90-100%

Accessibility
Infrastructure Accessibility 77%
Information Accessibility 74%
Digital Accessibility 52%
Economic Accessibility 34%
Beneficial Impact
Solution Effectiveness 81%
Problem Relevance 73%
Social Value Creation 88%
Sustainability 56%
Co-creation and Governance
Collaborative Innovation 57%
Grassroot Innovation Collaboration 57%
Inclusive Governance 55%
Ethical and Responsible Innovation
Reflexive Innovation 83%
Ethical Compliance 33%
Data Governance 36%
Risks and Harms
Long-term Loss 92%
Data Misappropriation 85%
Reinforcement of inequalities 76%
Supportive Ecosystem
Knowledge-based Resources 61%
Community Support 49%
Enabling Policies 32%
Usage Efficacy
Desirability 82%
Digital Skill Enhancement 73%
Usability 60%
0 25 50 70 90 100
Score (%)

Figure 1: Detailed performance analysis by subdimension

Do you know which Indica highest among Direct Use

• Loss of Skills and

Domain Evaluator Insights

The following responses were provided by Domain Eva

What is the best feature / quality of this

"I think its greatest strength is its ability to accurat

"The best quality of this tool is its ability to diagnos stakeholders, particularly farmers and extension ag identification, helping to improve decision-making people's interest in digital technologies and improv become more interested in agriculture, as the tool manage unfamiliar situations. since young people a important advantage in engaging them in farming."

"The tool demonstrates strong alignment between high-impact and time-sensitive agricultural challer productivity and livelihoods. it combines ai-driven support, creating a layered and actionable solution co-design approach with continuous stakeholder e field conditions. rather than replacing existing prac expertise, reinforcing and extending traditional app robust and context-aware, which is relatively unco

"It's offline functionality"

"The tool is accessible offline for a variety of users and is a user-friendly, ai-powered solution."

"Offline functionality, enabling use in low-connectivity areas and aligning well with its purpose."

What should the tool improve on?

"One area for improvement would be to make the app easier to use for everyone, including those who cannot read french or english. it would be useful to include an audio feature within the app. this would allow those who have not attended school to listen to the audio explaining the results to them after an analysis. alternatively, stickers or emojis could be incorporated to help interpret the results following an analysis. for benin, we propose a common language translated with deepl.com (free version)"

How an evaluation runs.

An evaluation can start at any stage of a tool's life, from early concept to live deployment.

WHO TAKES PART

Innovators & developers

Request the evaluation and act on its recommendations.

Domain experts

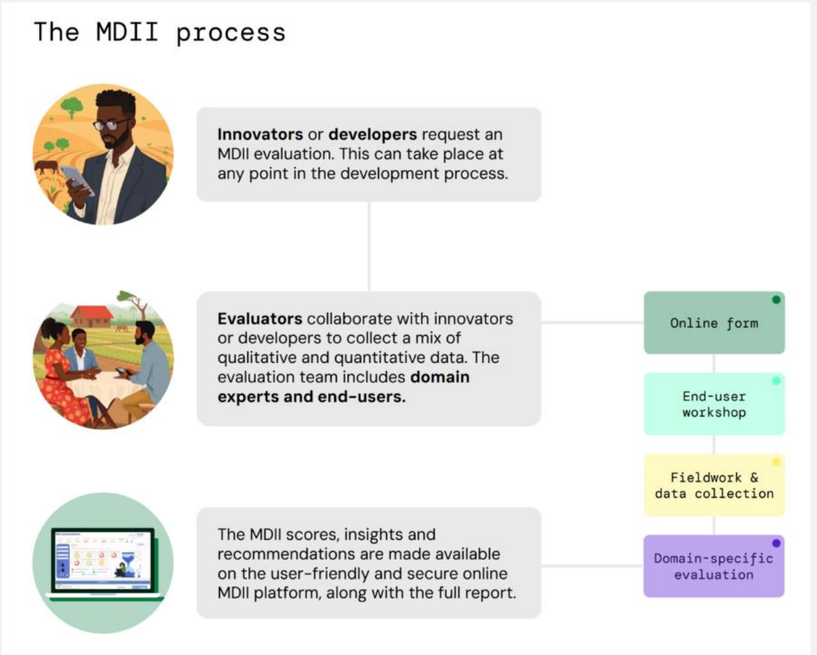
Review the tool through a dedicated evaluation panel.

Direct users

Share real use experiences through field surveys.

Downstream beneficiaries

Voice impacts even when they never touch the tool.



FAST ROUTE

An AI-powered **Rapid Assessment** delivers preliminary inclusiveness insights in a single chat session to support faster iteration cycles in early-stages of development.

A scientific framework for measuring inclusiveness.



Innovation usage

Accessibility
Measures availability and accessibility of digital resources for underrepresented groups.

Usage Effectiveness
Assesses the ease and effectiveness of digital tool and service usage among underrepresented users.

Supportive Ecosystem
Supports the seamless adoption and sustained use of digital solutions.

Social consequences

Beneficial Impact
Evaluates the positive impacts of digital innovations on underrepresented users.

Risks & Harms
Evaluation of the potential negative impacts that digital innovation products might have on users.

Stakeholder relationships

Ethical & Responsible Innovation
Ensures ethical practices and responsible innovation in digital initiatives.

Co-creation & Governance
Encourages collaborative innovation and inclusive governance in digital initiatives.

EVALUATION FRAMEWORK

3	7	23	90
Mega groups	**Dimensions**	**Subdimensions**	**Indicators**
	Accessibility, usage, ecosystem, impact, risks, ethics, co creation.	Each dimension broken into measurable subareas.	Individually scored signals. The diagnostic depth of the index.

EVALUATION SCORING TIERS

90%+	Exceeding — best practice, empowering
70% – 89%	Meeting — strong inclusiveness
50% –69%	Approaching — foundations met
25% – 49%	Below — significant gaps remain
0% – 24%	Significantly below — major redesign recommended

A version for various stage of digital innovation.

Regular MDII

For tools already in users' hands. Draws on real-time feedback from the people who use the tool.

APPLICABLE TO

- Controlled Testing
- Semi-Controlled Testing
- Prototyping
- Proven Innovation

Validates inclusiveness claims, surfaces scaling risks, and prioritises improvements with live evidence.

Ex-Ante MDII

For tools still in design. Anticipatory evaluation that builds in inclusion considerations before scale.

APPLICABLE TO

- Idea
- Basic Research
- Formulation
- Proof of Concept

Embeds inclusion goals into the design phase, when assumptions are still soft and changes are inexpensive.

An inclusive experience.

Product features designed to help tools reach their full potential.

01.

AI-assisted multilingual access

AI-supported translation capabilities help make assessments and findings accessible in low-resource languages.

02.

Field-ready

Supports offline and field-based data collection through desktop and synchronization capabilities for environments with limited internet access.

03.

Recommendation engine

Provides access to a growing library of practical inclusiveness improvements drawn from previous evaluations and implementation experiences.

04.

Automated coordination

Built-in reminders, notifications, and follow-ups keep evaluations moving, reducing manual coordination and helping ensure all perspectives are represented.

05.

Automated reporting

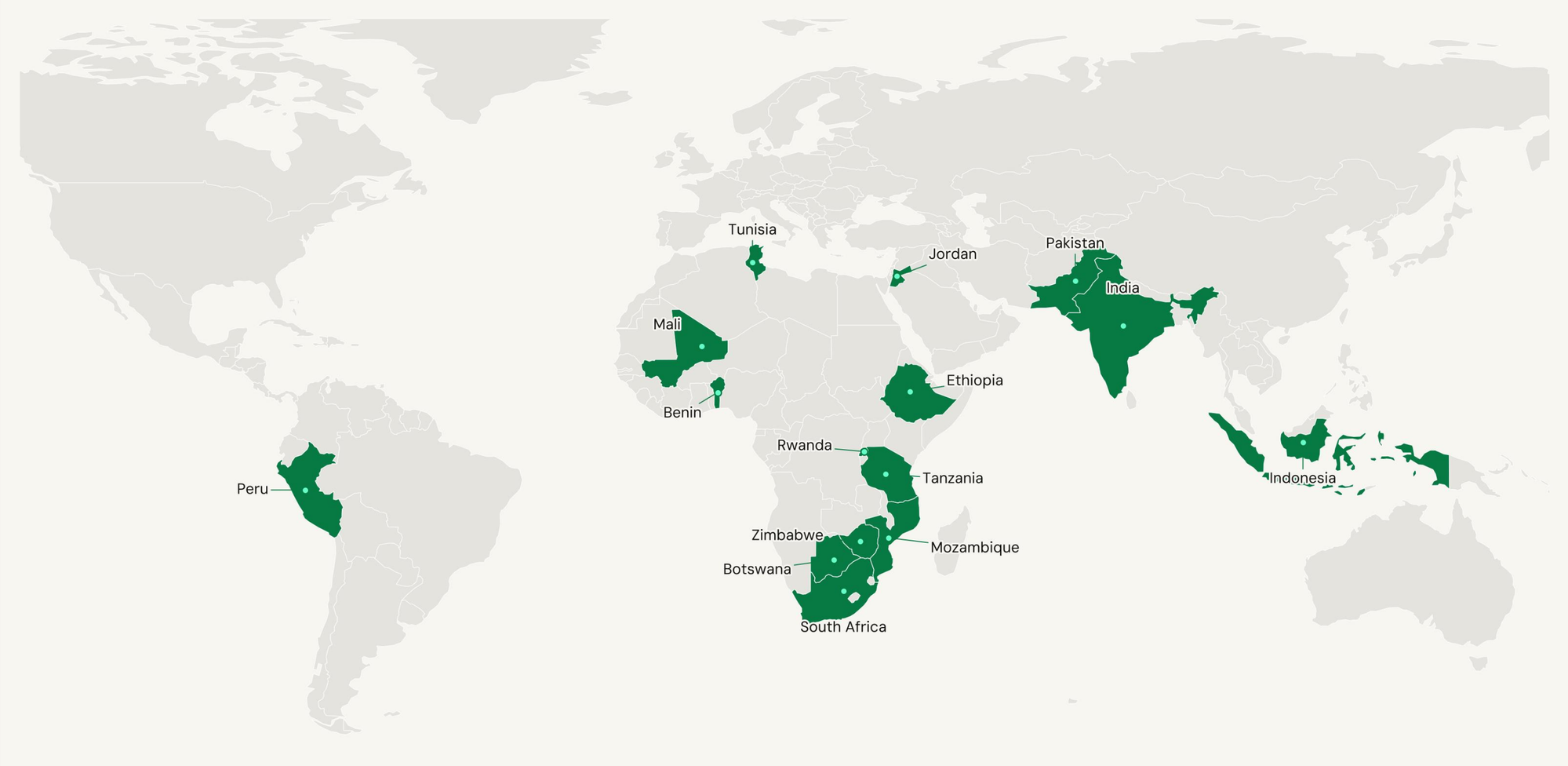
Transforms assessment responses into standardized reports, making results easy to interpret, compare, and share across projects and countries.

06.

Tailored user experience

Provides dedicated interfaces for coordinators, innovators, evaluators, translators, and domain experts, simplifying participation and reducing unnecessary complexity.

Evaluation areas.



What MDII delivered until now.

Users and Indirect Beneficiaries Reached

553

Tools under MDII

27

Countries

15

Survey Languages

7

Unique recommendations

157

Science Programs

2

Coordinators

7

37

Knowledge products

Technical reports, journal papers, WaPOR reports, recommendation notes, and briefs.

10

Presentations

Delivered to CGIAR audiences, partner institutions, and external research forums.

16

Communication assets

1 brief, 1 poster, 1 video script, 1 graphical abstract, 4 social cards, 8 report covers.

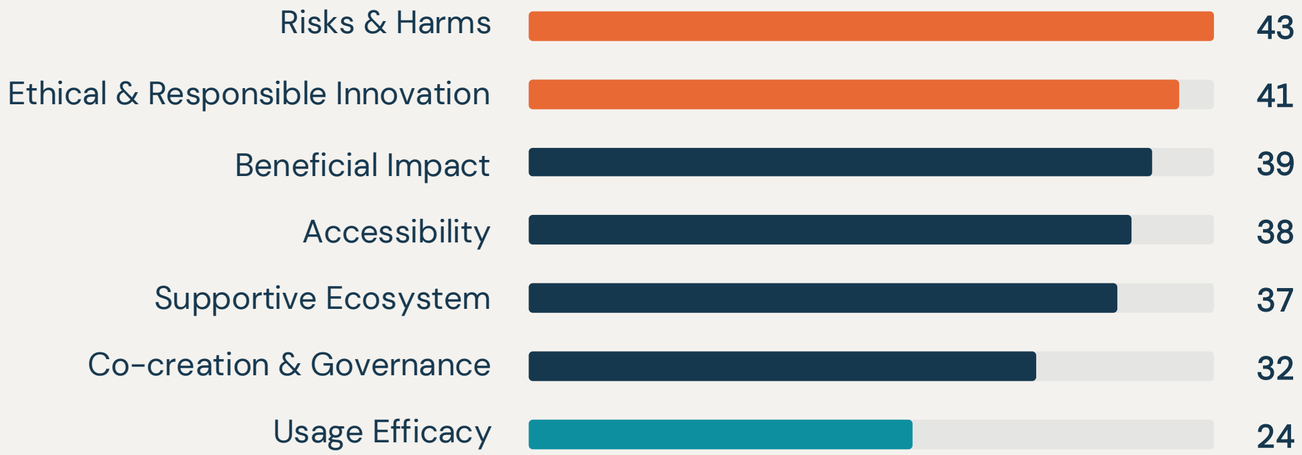
14

Capacity building

Onboarding series, video tutorials, train-the-trainer, email templates, guidelines, sessions.

Overall recommendations cluster on safeguards and ethics.

Where the **254** recommendations concentrate by MDII dimension.



Safeguards top the list

Risks & Harms and Ethical Innovation draw the most — trust and accountability are the most persistent gaps across tools.

Usage needs the fewest

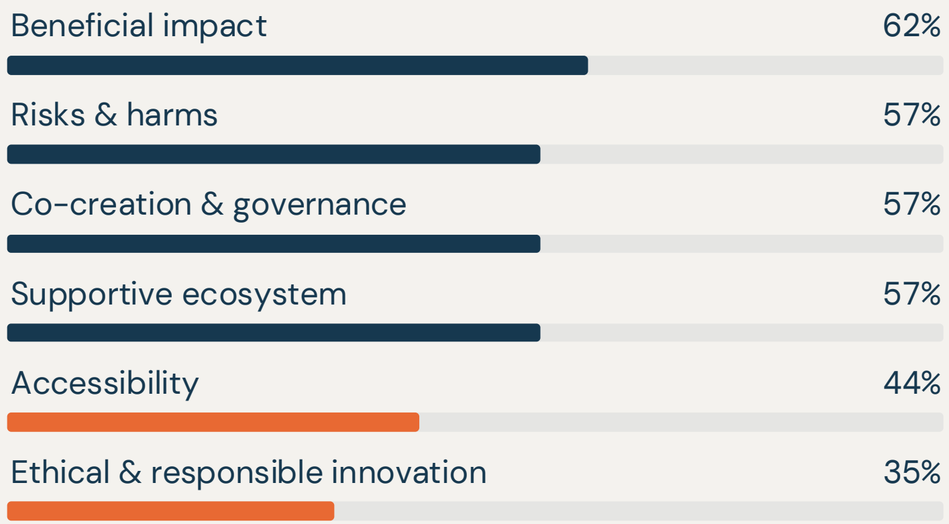
Usage Efficacy attracts the fewest — the dimension where the anticipatory Ex-Ante model is most often applied.

Governance matters as much as design

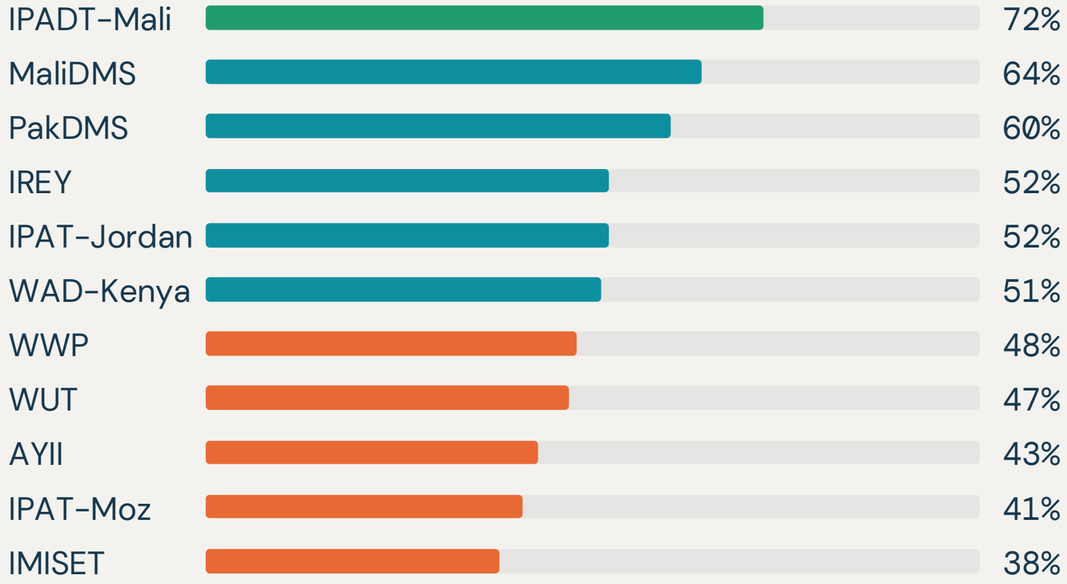
Co-creation and ecosystem gaps are as structurally important as the interface itself.

WaPOR Pilot: Eleven tools, seven countries, one portfolio view.

PORTFOLIO AVERAGE BY DIMENSION



OVERALL MDII SCORE BY TOOL



52% Portfolio mean: **Approaching** tier. Strong on impact & collaboration; affordability and ethics sit below. Averages hide wide-spread.

Selected findings.

01

Affordability is the clearest shared gap

Every one of the eleven tools scores below 50% on the economic side of access. Affordability, subsidies, and predictable costs are the three lowest-scoring indicators.

Because the gap is uniform, it points to one upstream cause — and can be addressed once, at programme level.

02

Ethical practice is weakest, and most uneven

Ethical & Responsible Innovation is the lowest-scoring dimension at 35%, with a range of 9% to 79% across the eleven tools.

The strongest tools show that sound ethical practice is achievable within the same operational context.

03

Deliberate inclusion correlates with higher scores

The four tools that took explicit GESI actions score higher on every dimension — Ethical Innovation reaches 55% in that group against under 30% elsewhere.

Inclusiveness responds to intention. It strengthens where teams act on it deliberately.

Low-effort wins for tool teams.

Given 254 recommendations.

In-app tooltips & guidance
Helps first-time and less technical users.

Shared FAQ & worked examples
Lowers the onboarding barrier for new users.

Spatial-resolution warnings
Supports safer reading of remote-sensing outputs.

Ethical-reflection checklist
A light ethics review at each tool update.

Plain-language output guidance
Reduces the complexity of interpreting results.

Responsible-use prompt at login
A lightweight, recurring ethical reminder.