mdii
multidimensional digital inclusiveness index

Project Brief and Sample Size Standard

mdii.iwmi.org

A consolidated reference for evaluators, coordinators, and innovators using the Multidimensional Digital Inclusiveness Index in agrisystems.

PART 01, PROJECT BRIEF

Project summary

Description. MDII (Multidimensional Digital Inclusiveness Index) is a scientific tool to assess and enhance digital inclusiveness across digital tools and platforms. It surfaces strengths and improvement areas so that digital solutions are accessible, equitable, and inclusive for underrepresented communities in agrisystems.

Target audience.
Researchers, evaluators, policymakers, and digital tool developers aiming to enhance inclusiveness.

Goal & objective.
Promote digital inclusiveness in agrisystems through a structured framework; deliver actionable insights and data-informed improvements.

Focus.
Marginalized communities in LMIC settings — women, youth, rural and indigenous communities, the elderly, and individuals with specific needs.

Innovation value.
A quantifiable measure enabling CGIAR projects to act with precision; evidence for policymakers to support gender- and inclusion-responsive innovations.

1.2 CONTEXT

Relation to agrisystems

MDII draws on scientific insights to identify the inclusiveness factors that matter for marginalized farmers. By addressing barriers faced by women and other underrepresented groups, it promotes fair access to digital tools that drive productivity, sustainability, and market integration — at every stage from policymaking to infrastructure and training.

Existing indices (Internet Index, Global Open Data Index, ICT Development Index) lack the dimensions needed for agrisystems — technological, sociocultural, economic, and ethical indicators tailored to marginalized farmers — and most are not developed with the realities of less-industrialized countries in mind.

1.3 WHO AND WHAT

User roles & MDII components

USER ROLES

Requester. Initiates the evaluation — innovators or developers gauging their tool's inclusiveness.

Evaluators. Domain experts and end-users assessing the tool with quantitative and qualitative methods.

Consumers. Policymakers and developers who use MDII results to guide decisions and enhance inclusivity.

MDII COMPONENTS

Index. Structured scoring system quantifying inclusiveness across accessibility, usability, and cultural relevance.

Platform. User-friendly digital environment for data collection, evaluation, and reporting — online and offline.

1.4 STRUCTURE

Index framework

3	7	23	90
Mega-groups	**Dimensions**	**Subdimensions**	**Indicators**

Mega-groups. Innovation Usage, Social Consequences, Stakeholder Relationships.

Dimensions. Accessibility, Usage effectiveness, Supportive ecosystem, Beneficial impact, Risks & harms, Ethical & responsible innovation, Co-creating & governance.

1.5 SCORING

Digital inclusiveness scoring tiers

RANGE	TIER	WHAT IT MEANS
🟢 90–100%	**Exceeding**	Best-practice; fully adaptable and empowering.
🟢 70–89%	**Meeting**	Strong inclusiveness; addresses diverse user needs.
🟢 50–69%	**Approaching**	Foundational standards met; basic access & usability.
🟡 25–49%	**Below**	Partially meets benchmarks; significant gaps.
🔴 0–24%	**Significantly below**	Major deficiencies; redesign needed.

1.6 METHOD

Scoring system & index versions

SCORING & WEIGHTING

Scoring scale. Tiered scoring across five levels (see 1.5) — reflects how well tools align with inclusiveness benchmarks.

Model weightings. Equal weighting across dimensions and indicators for transparency. Post-pilot work will explore data-driven adjustments.

INDEX VERSIONS

Regular version. For tools in advanced stages (Controlled Testing, Prototyping, Semi-Controlled Testing, Proven Innovation) — uses real-time feedback from active users.

Ex-Ante version. For tools in early stages (Idea, Basic Research, Formulation, Proof of Concept) — provides anticipatory evaluation.

1.7 DATA

Collection methods & handling

COLLECTION METHODS

Online. Digital forms for innovators and evaluators to submit data and contextual feedback.

Offline. Excel tool mirroring the online survey; structured interviews with users, beneficiaries and evaluators; field notes.

Hybrid. Any combination of the above.

DATA HANDLING

Storage & security. Secure storage with confidentiality and data-protection compliance.

Processing. Responses mapped to dimensions and indicators for scoring.

Verification. Quality checks; inconsistencies addressed; key responses validated.

Access & privacy. Raw data restricted to authorized personnel; aggregated results shared with stakeholders.

1.8 PEOPLE & PROCESS

Evaluation team & process

Team. Innovators (develop the tool); Coordinator (manages process, quality, framework adherence); Interviewers (collect data via structured interviews); Evaluators: subject-matter experts, users, and downstream beneficiaries.

Process.

01 Initiation — Innovator requests evaluation; Coordinator sends the Online Form.

02 Identify end-users & beneficiaries; organize workshop.

03 Fieldwork — Interviewer runs surveys and interviews.

04 Domain-specific evaluation — selected evaluators score using the Domain-Specific form.

05 Processing — MDII Team compiles, analyzes, and computes the score.

06 Reporting & feedback — Inclusiveness Report delivered to the Innovator.

Scale. 5-point Likert ("Not at all" to "Fully Agree"), with a "Don't Know" option for items lacking sufficient information.

1.9 OUTPUTS

Outputs, support tools & AI

OUTPUTS & VISUALS

Overall score. Single inclusiveness score across dimensions.

Recommendations. Targeted actions to improve inclusiveness.

Dashboard. Online tool for cross-tool comparison.

Report. Per-tool breakdown by dimension and indicator.

SUPPORT TOOLS

Innovator compilation. PDF guiding domain-specific evaluators.

Evaluation forms. Structured forms for systematic scoring.

Implementation guides. For innovators, coordinators, and evaluators.

Offline toolkit. Excel tool for low-connectivity settings; auto-generates reports.

AI INTEGRATION

AI personas. Simulated subject-matter expert profiles used for evaluations.

AI recommendations. Grounded in current agricultural science; tailored suggestions to address specific inclusiveness gaps.

1.10 REFERENCES

Further reading

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PART 02, SAMPLE SIZE STANDARD, GUIDELINES

A precision-based standard for direct-user surveys

MDII surveys historically lacked a documented standard for sample size in direct-user surveys, leading to inconsistent assumptions and weak methodological justification in reports and papers. This guideline adopts a precision-based approach (estimating population-level proportions, not hypothesis testing) — appropriate for MDII's diagnostic purpose. Documentation should avoid disciplinary labels (e.g. epidemiology), emphasize precision-based estimation, and state assumptions explicitly.

2.1 DEFAULTS

Recommended default assumptions

PARAMETER	VALUE	RATIONALE
Confidence level	95 %	Indicates how precise the results should be. A smaller percentage means more precision but requires more interviews; a larger percentage means less precision and fewer interviews.
Expected proportion (p)	50 %	Conservative — maximizes variability when no prior estimate exists.
Margin of error (d)	±10 %	Both EAV and RV; appropriate precision for diagnostic assessments.
Design effect (DEFF)	1.5	It accounts for the fact that respondents are often sampled in groups (such as villages, schemes, or associations), where answers may be more similar than in a purely random sample.
Effective response rate	~75 %	Buffer for refusals, non-contact, incomplete and quality-control exclusions.

2.2 EQUATION & REFERENCE

Formula and required sample sizes

Sample size *n*

$$\frac{[DEFF*Np(1-p)]}{[(d^2/Z^2_{1-\alpha/2}*(N-1)+p*(1-p)]}$$

n = Required completed sample size
N = Total direct-user population
p = Expected proportion — default 0.5
d = Margin of error — default 0.10
Z = Z-score — 1.96 for 95% CI
DEFF = Design effect — default 1.5

Schaeffer RL, Mendenhall W, Ott L. Elementary Survey Sampling, Fourth Edition. Duxbury Press, Belmont, California 1990.

POP. N	COMPLETED N	PLAN (N / 0.75)
50	50	67
100	74	99
200	98	131
250	105	140
400	117	156
500	122	162
1,000	132	176
5,000	142	189

Values rounded up. "Plan" column buffers for 75% effective response rate.

2.3 WORKFLOW & REPORTING

Calculator workflow and reporting template

USING THE OPENEPI CALCULATOR

Open OpenEpi in a new tab; enter the parameters; copy the resulting sample size back into the MDII form.

Population size (N). Refers to the total number of people in the group you want to represent (e.g. all direct users who use the tool).

Anticipated % (p). Represents the proportion of the population expected to give a particular type of response.

Confidence limits (d). Use 10 — appropriate for diagnostic use.

Design effect. Use 1.5 — standard for clustered samples.

Result. The value is the number of completed valid interviews needed; plan extra to absorb non-response (see 2.2 reference table).

PASTE & ADAPT — REPORTING TEMPLATE

*Sample size was determined using a precision-based approach for estimating population-level proportions (Cochran with finite population correction; Sullivan & Pezzullo, OpenEpi). We assumed a 95% confidence level, p = 50%, a margin of error of ±10%, and a design effect (DEFF) of 1.5 to account for clustered field sampling. From a target population of **[N]** direct users, this yields **[n]** completed interviews. To absorb refusals, non-contact and quality-control exclusions we planned for a ~75% effective response rate, targeting **[n / 0.75]** attempted interviews.*

2.4 SCOPE & CAVEATS

Scope, non-response & acceptance

Scope. This standard applies only to direct users. Sampling for domain-specific evaluators, downstream beneficiaries, and consumers will be covered in separate guidelines.

Non-response. Even with face-to-face enumeration, expect attrition. The 75% buffer fits most contexts; adjust upward in stable settings or downward where evidence indicates higher loss.

Acceptance criteria. A reviewer can reproduce the sample-size logic; the rule is reusable across tools, countries and contexts; the approach stays conservative, transparent, and aligned with MDII's diagnostic purpose.

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