Bristlepine
Resilience Consultants

ILRI - Measuring what matters: tracking the effectiveness of climate adaptation for smallholder producers

Deliverable 1: Inception Report (Interim)
v1

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Approved by:

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1. Background

A growing number of climate adaptation actions and initiatives are being deployed across agri-food systems to build resilience—defined by the Food and Agriculture Organization (FAO) as the capacity to prevent, absorb, and recover from crises sustainably and efficiently. Yet, a central challenge persists: how to measure whether these interventions are truly effective. Fundamental disagreements remain over how to define and assess adaptation and resilience, and without robust, consistent, and context-sensitive evaluation methods, policymakers and practitioners struggle to allocate resources, make informed decisions, or demonstrate impact.

Monitoring and Evaluation (M&E) in this space is particularly complex due to long timeframes, evolving climate baselines, and attribution challenges. While a variety of frameworks are in use—including process- and results-based evaluations, resilience assessments, economic analyses, and participatory approaches—the field remains fragmented. Many methods are difficult to compare or apply in smallholder contexts due to questions around their relevance, cost, and scalability. This review responds to these challenges by systematically identifying, comparing, and appraising methods used to evaluate the effectiveness of climate adaptation interventions in agri-food systems, with a focus on smallholder producers in low- and middle-income countries. The goal is to generate a strong, policy-relevant evidence base to inform the selection, design, and scaling of credible, inclusive, and cost-effective evaluation frameworks—especially as global efforts accelerate toward finalizing adaptation indicators under the Global Goal on Adaptation.

2. Research Questions

This review aims to systematically identify, characterize, and compare the methods used to track and measure adaptation outcomes associated with climate adaptation actions targeting smallholder producers in the agri-food sector. Because the evidence base consists of diverse methodological approaches rather than causal-effect studies, the review is structured around a *Population–Concept–Context–Methodological Focus (PCCM)* framework.

The review proceeds in two stages. The following research questions guide both stages.

1. A systematic map to catalogue the full range of adaptation outcomes and associated measurement approaches used in agri-food systems.
2. A systematic review of methods focusing on methodological strengths, limitations, and suitability for different users and contexts.

2.1. Primary Research Question

RQ1. What adaptation outcomes have been measured for smallholder producers in the agri-food sector, and what methods have been used to track, evaluate, or quantify these outcomes?

This question focuses on identifying both:

- the types of adaptation outcomes (e.g., resilience, productivity, reduced climate losses, improved well-being), and

- the methods used to measure them (frameworks, indicators, M&E systems, analytical approaches, participatory tools, digital/data-driven methods).

2.2.   Secondary Research Questions

- **RQ2. How do adaptation measurement methods vary in their structure, data requirements, cost, scalability, and usability in low-resource settings?**
- **RQ3. To what extent do these methods enable the assessment of adaptation outcomes for marginalized subpopulations, including women, youth, low-income or landless producers, and other underrepresented groups?**
- **RQ4. How well do existing methods meet the needs of governments, donors, and practitioners seeking to design, monitor, and scale effective and equitable adaptation interventions?**

These questions support comparative analysis and highlight equity, feasibility, and policy relevance.

3.   Overall Approach to Review

3.1.   Scope and Boundaries (PCCM Framework)

The review is guided by the PCCM structure:

Population (P) - Smallholder producers in agri-food systems, including: smallholder farmers, pastoralists, agro-pastoralists, small-scale livestock keepers, fishers, mixed farming households, and landless or low-income rural producers in low- and middle-income countries. The population also includes institutions that design or implement adaptation measurement approaches relevant to these producers.

Primary population (beneficiaries):
➔ Smallholder farmers
➔ Smallholder crop producers
➔ Smallholder livestock herders
➔ Pastoralists & agro-pastoralists
➔ Small-scale livestock keepers
➔ Small-scale fishers / aquaculture producers
➔ Mixed-farming households
➔ Landless laborers and resource-poor producers
➔ Women, youth, and other marginalized groups

Secondary population (method users):
➔ Implementers, evaluators, researchers
➔ Government agencies
➔ NGOs & multilaterals
➔ Private-sector partners developing or applying measurement approaches

Concept (C) - Adaptation outcomes or processes resulting from climate adaptation actions in agri-food systems. These may include biophysical, economic, social, resilience-related, gender and inclusion outcomes, or other measures of adaptation success.

Adaptation outcomes (what is measured):
➔ Biophysical outcomes (yield stability, reduced losses)
➔ Economic outcomes (income stability, reduced variability)
➔ Social outcomes (well-being, food security)

Adaptation processes (how adaptation unfolds):
➔ Uptake/adoption of practices
➔ Behavioral or livelihood adjustments
➔ Participation in planning & decision-making

➔ Resilience outcomes (absorptive, adaptive, transformative capacities)
➔ ender & equity outcomes (distributional impacts)
➔ Adaptive capacity outcomes (knowledge, technologies, decision-making)

➔ Strengthening institutions or systems
➔ Learning, feedback loops, adaptive management

Context (C) - Climate adaptation actions, projects, programs, or practices implemented within agri-food systems (crops, livestock, mixed systems, fisheries, rangelands, and value chains) in low- and middle-income countries, particularly in climate-vulnerable regions.

Sectoral context:
➔ Agri-food systems (crops, livestock, mixed systems, rangelands, fisheries, value chains)

Geographic context:
➔ LMICs across Africa, Asia, South America

Institutional context:
➔ Governments, donors, development organizations, research institutions

Climate adaptation context:
➔ Adaptation actions responding to:
  ◆ Water scarcity
  ◆ Heat stress
  ◆ Pests/diseases
  ◆ Floods/droughts
  ◆ Market disruptions
  ◆ Rangeland degradation
  ◆ Coastal/fisheries impacts

Methodological Focus (M) - Methods used to track, measure, or evaluate adaptation outcomes and/or processes, including: indicator frameworks, resilience metrics, M&E systems, data collection tools, analytical and modeling approaches, participatory and locally led methods, and digital or remote-sensing-based techniques. Methods will be analyzed with attention to cost, scalability, inclusivity, data demands, methodological rigor, and policy utility.

Measurement frameworks:
➔ PROVIA, TAC, resilience frameworks, EbA frameworks
➔ Theories of Change

Outcome/process measurement methods:
➔ Indicators & metrics (biophysical, socioeconomic, resilience, gender-equity)
➔ Monitoring systems (M&E, MEL, RBM, adaptive management)

Data collection methods:
➔ Household surveys
➔ Administrative data
➔ Remote sensing
➔ Sensor/IoT
➔ Citizen-generated or participatory data
➔ Locally led methods

Analytical methods:
➔ Impact evaluation approaches
➔ Attribution methods
➔ Modeling & scenario analysis
➔ Quasi-experimental methods
➔ Machine learning, geospatial analytics, data fusion

Method attributes (for comparative assessment):
➔ Cost
➔ Scalability
➔ Inclusivity & disaggregation capacity
➔ Rigor & validity
➔ Data requirements
➔ Policy relevance & usability

3.2. Key Definitions

Adaptation outcomes: The results of adjustments in ecological, social, or economic systems to moderate potential damages and benefit from opportunities from climate change (IPCC).

Climate adaptation intervention: Any action, measure, or strategy intended to adjust in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects (IPCC).

Measurement method: Any framework, tool, indicator set, monitoring approach, data source, analytical technique, or participatory process used to track or evaluate adaptation outcomes.

Smallholder producers: Individuals or households engaged in small-scale agricultural, pastoral, fisheries, or mixed agri-food production, typically operating with limited land, labor, or capital.

4. Search Strategy

The search strategy is designed to identify all available empirical and methodological literature relevant to the methods used to track and measure the effectiveness of climate adaptation interventions for smallholder producers in agri-food systems. The strategy adheres to PROCEED and CEE guidelines and incorporates multiple sources: (1) large bibliographic databases, (2) web-based search engines, (3) organisational and institutional grey-literature repositories, and (4) citation chasing.

Searches will be conducted using combinations of structured Boolean search strings tailored to each database's syntax. Search terms will reflect the PCCM framework (Population—Concept—Context—Methodological focus), including synonyms and variant terminology for smallholder producers, climate adaptation interventions, agri-food systems, and adaptation measurement methods.

Search terms for major sources will be fully documented with precise search strings to enable replication. Searches of organisational websites and grey-literature sources will be conducted using flexible combinations of keywords appropriate to each site's search capacity.

No date limits will be applied in the initial search to ensure full retrieval of relevant methodological literature. Language restrictions will be limited to languages for which the team has screening capacity (initially English and French; translations may be sought for highly relevant non-English studies where feasible).

The final search strategy will be refined following stakeholder consultation.

4.1. Bibliographic databases

Provide details of all bibliographic databases to be searched, including database names accessed, institutional subscriptions (or date ranges subscribed for each database), search options (e.g. 'topic words' or 'full text' search facility), languages and search strings

We will search the following bibliographic databases, chosen for their coverage of environmental science, climate adaptation, agricultural research, development studies, and evaluation methodologies:

Primary Databases

Scopus (Elsevier): Broad coverage of interdisciplinary climate and agricultural sciences.

- Search fields: Title, abstract, keywords
- Access: Cornell University subscription

Web of Science Core Collection (Clarivate): Includes SCIE, SSCI, and emerging research.

- Search fields: Topic (title, abstract, author keywords)
- Access: Cornell University subscription

CAB Abstracts (CABI): Highly relevant for agriculture, smallholders, and rural development.

- Search fields: Topic
- Access: Institutional subscription

AGRIS (FAO): Agriculture and rural development, including grey literature.

- Search fields: Keyword
- Access: Open access

Academic Search Premier (EBSCO): Development studies and evaluation methodologies.

- Search fields: Title, abstract, subject terms
- Access: Institutional subscription

Draft Search String (Scopus example)

(

  "smallholder*" OR "small-scale farm*" OR "small farm*" OR "family farm*" OR

  "pastoralist*" OR "agro-pastoral*" OR "small-scale livestock" OR

  "small-scale fisher*" OR "artisanal fisher*" OR "aquaculture producer*" OR

  "mixed-farming" OR "rural producer*" OR "resource-poor producer*" OR

  "landless labor*" OR "women farmer*" OR "female farmer*" OR "youth farmer*"

)

AND

(

  "climate adaptation" OR "adaptation action*" OR "adaptation intervention*" OR

  "adaptation strateg*" OR "resilience-building" OR "climate-resilient" OR

  "climate risk management" OR "adaptation practice*" OR "climate-smart agriculture" OR

  "ecosystem-based adaptation" OR "locally led adaptation"

)

AND

(

  "adaptation outcome*" OR "resilience outcome*" OR "resilience capacity" OR

  "adaptive capacity" OR "well-being" OR "food security" OR "yield stabilit*" OR

  "productivity" OR "livelihood*" OR "vulnerability reduction" OR

```
    "behavioral change" OR "livelihood change" OR "institutional strengthening" OR

    "participation" OR "adoption"

)

AND

(

    "monitoring" OR "evaluation" OR "M&E" OR "MEL" OR "RBM" OR

    "indicator*" OR "metric*" OR "measurement" OR "measurement framework*" OR

    "data collection" OR "survey" OR "remote sensing" OR "geospatial" OR

    "impact assessment" OR "impact evaluation" OR "attribution" OR

    "modeling" OR "scenario analysis" OR "quasi-experimental" OR

    "machine learning" OR "data-driven" OR "digital tool*" OR "participatory method*"

)

AND

(

    agricultur* OR "agri-food" OR "food system*" OR crop* OR livestock OR

    fish* OR rangeland* OR "mixed farming" OR "value chain"

)
```

Secondary Databases (Methodology + Social Science)

- EconLit (AEA): Relevant for impact evaluation methods.
- ProQuest Dissertations & Theses Global: For file-drawer methodological work.
- Lens.org: Broad meta-database for capturing interdisciplinary methods-oriented material.

4.2. Web-based search engines

Web-based search engines will be used to retrieve academic and grey literature not captured in bibliographic databases.

- **Google Scholar**
- **Google** (general search)
- **DuckDuckGo** (to reduce personalization bias)

Approach:

- Use simplified and truncated versions of core search strings (due to character limits).
- Screen first 200–300 results per string, consistent with CEE guidance.
- Record search date, search terms, and number of hits.

Example Google Scholar String

```
"climate adaptation" "smallholder" ("adaptation outcome" OR "resilience" OR "adaptive capacity" OR "livelihoods")
```

4.3. Organizational websites

We will search organizational repositories relevant to:

- CGIAR centers (CIMMYT, CIAT, ICARDA, IFPRI, ILRI, WorldFish)
- UN agencies: FAO, IFAD, UNEP, UNFCCC (incl. PROVIA, NAP Global Network)
- Development agencies: World Bank, GEF, GCF, USAID, DFID/FCDO, ADB, AfDB, IDB
- International research initiatives: IPAM, Adaptation Research Alliance, GCA
- Major NGOs/INGOs: CARE, Oxfam, Mercy Corps, Practical Action, World Vision
- Evaluation and M&E networks: 3ie, Campbell Collaboration, CLEAR, J-PAL, Innovations for Poverty Action

Search terms for these sites will be flexible and tailored to each repository's search features. We will use combinations of keywords related to smallholder producers (e.g., "smallholder," "pastoralist," "small-scale fisher"), adaptation outcomes (e.g., "resilience outcome," "adaptive capacity," "food security," "yield stability"), adaptation processes (e.g., "adoption," "livelihood diversification," "institutional strengthening," "participation," "learning"), and methodological approaches (e.g., "indicator," "metric," "measurement," "monitoring," "evaluation," "M&E," "impact assessment," "remote sensing," "participatory method"). Contextual terms will also be used, including "agriculture," "agri-food systems," "climate adaptation," "adaptation intervention," and "climate-smart agriculture."

We will record:

- Site name
- URL
- Search method (internal search engine or manual browsing)
- Results retrieved

4.4. Comprehensiveness of the search

We will assess search comprehensiveness through the following procedure:

1. *Benchmark List Assembly*

Develop an independently assembled list of ~20–30 key studies/frameworks known to be eligible, curated through:

- Initial expert identification (ILRI, Neal Haddaway)
- Stakeholder input
- Prior literature reviews (e.g., PROVIA 2013; IPCC WGII AR6 adaptation chapters; GAMI outputs)

2. *Percent Retrieval Check*

For each major database (Scopus, Web of Science, CAB Abstracts), we will check whether the draft search string retrieves all benchmark items.

3. *Refinement*

When benchmark studies are missed:

- Adjust synonyms and substrings
- Add missing variant terminology
- Recheck until 100% retrieval is achieved or missing items are justified as out of scope.

4. *Documentation*

All adjustments to the search strings and outcomes of benchmark retrieval tests will be recorded and included in Annex 1 to ensure transparency and replicability.

4.5. Search Update

Given the nine-month project duration, we plan to:

- Conduct the initial full search after stakeholder engagement and protocol finalization.
- Conduct one update search during the systematic map stage (prior to finalizing the evidence map).
- Conduct a second update search before initiating the systematic review of methods (Deliverable 6 onward), limited to major databases using the finalized strings.
- Document the update dates and additional records retrieved.

We do not anticipate major changes in adaptation-method literature within short intervals, but update searches ensure completeness and meet PROCEED standards.

5. Stakeholder Engagement

Stakeholder engagement is an integral part of this systematic mapping process and ensures that the review remains relevant, credible, and useful for decision-makers working in climate adaptation and agri-food systems. Stakeholders contribute expertise on policy priorities, methodological considerations, contextual knowledge, and sources of evidence. Their involvement strengthens the review's rigor and enhances the likelihood that its findings will be taken up by practitioners, funders, and researchers.

Stakeholders will be invited to engage at key points throughout the nine-month review, including during question formulation, protocol development, review of findings, and dissemination. Specifically, stakeholders will:

- Prioritize and refine the draft research questions, ensuring they reflect pressing policy needs and are appropriately focused for a systematic map.
- Provide feedback on specific sections of the draft scoping review protocol (this document), including review questions, scope, boundaries, definitions, and methodological considerations.
- Suggest and help identify key sources of evidence, especially seminal studies, grey literature, and ongoing initiatives that may not be captured through database searches.
- Highlight gaps, missing data, or blind spots in the emerging evidence base.

- Review and comment on the scoping review and systematic review protocols prior to their finalization.
- Provide feedback on the draft findings and final report, helping ensure the outputs are accurate, policy-relevant, and methodologically sound.
- Support dissemination and communication of the review, including sharing findings within their networks to enhance reach and impact.

This structured, multi-stage engagement will help ensure the review answers the most important questions for stakeholders working to advance effective, equitable climate adaptation for smallholder producers.

5.1.   List of Stakeholders

An initial set of stakeholders has been identified and will be engaged in the first stakeholder consultation to provide feedback on the draft protocol for the scoping review and systematic map, including its research questions, scope, and proposed methods.

Sr. No	Surname	First name	Institution/Organisation	Email
1	Akinseye	Folorunso	ICRISAT	Folorunso.Akinseye@icrisat.org
2	Martinez-Baron	Deissy	Alliance Bioversity-CIAT	d.m.baron@cgiar.org
3	Segnon	Alcade	Alliance Bioversity-CIAT	a.segnon@cgiar.org
4	Kramer	Berber	IFPRI	b.kramer@cgiar.org
5	Pankaj Koirala	Pankaj	CIMMYT	p.koirala@cgiar.org
6	Schut	Thijs	WorldFish	t.schut@cgiar.org
7	Habermann	Birgit	ILRI	B.Habermann@cgiar.org
8	Nepal	Santosh	IWMI	S.Nepal@cgiar.org
9	Rusinamhodzi	Leonard	IITA	L.Rusinamhodzi@cgiar.org
10	Hellin	Jon	IRRI	j.hellin@cgiar.org
11	Huyer	Sophia	ILRI	s.huyer@cgiar.org
12	Bullock	Renee	ILRI	R.Bullock@cgiar.org
13	Nowak	Andreea	Alliance Bioversity-CIAT	a.nowak@cgiar.org
14	Klein	Richard	Stockholm Environment Institute (SEI) / PROVIA Guidance Coordinator	richard.klein@sei-international.org
15	Patwardhan	Anand	UMD School of Public Policy; Co-Chair, WASP Science Committee	apat@umd.edu

16	Hinkel	Jochen	Global Climate Forum, Germany / PROVIA Author	hinkel@globalclimateforum.org
17	Amwata	Dorothy	Murang'a University of Technology, Kenya	damwata@mut.ac.ke; damwata@yahoo.com
18	Hussain	Abid	International Centre for Integrated Mountain Development (ICIMOD)	abid.hussain@icimod.org
19	Biesbroek	Robbert	Wageningen University & Research, Netherlands	robbert.biesbroek@wur.nl
20	Nalau	Johanna	Griffith University, Australia	j.nalau@griffith.edu.au
21	Leiter	Timo	London School of Economics and Political Science	T.L.Leiter@lse.ac.uk
22	Seidou	Ousmane	University of Ottawa	oseidou@uOttawa.ca
23	Barragán	Carolina Zambrano	Metropolitan District of Quito, Ecuador	cgzambrano@senescyt.gob.ec
24	Debela	Nega Emiru	International Platform for Adaptation Metrics (IPAM)	N.debela@yahoo.com
25	Njuguna	Lucy	CGIAR	l.njuguna@cgiar.org
26	Wolf	Julia Yvonne	FAO (Food and Agriculture Organization)	Julia.Wolf@fao.org
27	Singh	Pramod K.	Institute of Rural Management Anand, India	pramod@irma.ac.in; pramodirma@gmail.com
28	Constas	Mark	Cornell University	mark.constas@cornell.edu
29	Ives	Nate	Consultant (former USAID)	ives.nathan@gmail.com
30	Carter	Rebecca	World Resources Institute	Rebecca.carter@wri.org
31	Schipper	Lisa	University of Bonn	lschipper@uni-bonn.de
32	Clarkson	Graham	University of Reading	g.clarkson@reading.ac.uk
33	Dorward	Peter	University of Reading	p.t.dorward@reading.ac.uk
34	Kohli	Rohini	UNDP	rohini.kohli@undp.org
35	Gesti	José	Sanitation and Water for All	jose.gesti@sanitationandwaterforall.org
36	Campbell	Donovan	UWI	donovancampbell@gmail.com

5.2.   Date of 1st Stakeholder Meeting

The first stakeholder meeting is scheduled for **Mon, Dec 8th, 2025 - 9 AM (ET)**.

6.   Detailed Gantt Chart

Milestone	Sub-Tasks & Deliverables	Deadline	N	D	J	F	M	A	M	J	J
1. Inception Phase	Team kickoff and work planning		░								
	All team members to attend a 2–3-day basic training on systematic review methodology offered by Dr. Neal Haddaway on behalf of the CGIAR/ILRI.		░								
	Stakeholder mapping and engagement plan, consultations to refine RQ		░								
	Draft and finalize inception report that includes the final RQs, and overall approach to the review, including proposed search strings, volume of literature surfaced and detailed gantt chart showing different steps of the review		░								
	Deliverable 1: Inception Report that includes the final RQs, and overall approach to the review, including proposed search strings, volume of literature surfaced and detailed gantt chart showing different steps of the review (interim)	Month 1	■								
2. Protocol Development for Scoping Review	Conduct preliminary literature scan and define PECO framework			░							
	Develop search strategy, eligibility criteria, and screening approach			░							
	Draft protocol for scoping review and systematic mapping			░							
	Deliverable 2: First draft of protocol for scoping review and systematic maps (interim)	Month 2		■							
3. Protocol Finalization & Registration	Peer and stakeholder review of draft protocol				░						
	Revise protocol and finalize inclusion/exclusion criteria and tools				░						
	Publish protocol for a scoping review and a systematic map to CGSpace or equivalent repository				░						
	Deliverable 3: Final protocol for a scoping review and a systematic map published on either CGSpace (CGIAR's document repository) or any other publicly available specialized repository (final)	Month 3			■						
4. Drafting Scoping Review & Systematic Map	Conduct literature screening, coding, and data extraction					░					
	Conduct initial synthesis and develop typology framework					░					
	Draft narrative synthesis and evidence map					░					
	Deliverable 4: First draft of the scoping review and systematic map including a searchable data base of evidence and evidence gap map (interim)	Month 4				■					
5. Final Scoping Review Submission	Internal and external review of draft = Stakeholder consultations for receiving feedback on the first draft of the scoping review and systematic map						░				
	Finalize synthesis and comparative tables						░				
	Develop a searchable data base of evidence and evidence gap map						░				
	Publish final draft of the scoping review and a systematic map on CGSpace or submit to journal						░				
	Deliverable 5: Final draft of the scoping review and a systematic map, including a searchable data base of evidence and evidence gap map published either on CGSpace or any other public repository or submitted to a journal for publication (final)	Month 5					■				
6. Protocol Development for Systematic Review / Meta-analysis	Define review parameters, risk of bias approach, and synthesis plan							░			
	Draft protocol with methodological plan and tools							░			
	Team review and finalization							░			
	Deliverable 6: First draft of protocol for systematic review/meta-analysis protocol (interim)	Month 6						■			
7. Final Systematic Review Protocol	Peer review of protocol								░		
	Revise protocol and finalize quality appraisal methods								░		
	Publish to CGSpace or equivalent								░		
	Deliverable 7: Final protocol for systematic review/meta-analysis published on CGSpace (CGIAR's document repository) or any other publicly available specialized repository (final)	Month 7							■		
8. Draft Systematic Review / Meta-analysis	Conduct full screening, extraction, and critical appraisal									░	
	Synthesize findings and finalize typology and decision matrix									░	
	Draft full systematic review manuscript									░	
	Deliverable 8: First draft of systematic review/meta-analysis ready for submission to a journal (interim)	Month 8								■	
9. Final Submission & Dissemination	Stakeholder consultations for receiving feedback on the first draft of the systematic review/meta-analysis										░
	Finalize systematic review for journal submission										░
	Prepare and polish PowerPoint presentation - PPT must summarize all outputs (protocols, systematic maps, systematic review) and key findings and takeaways for a lay audience.										░
	Share outputs with stakeholders and finalize policy brief and tools										░
	Deliverable 9: Final draft of systematic review/meta-analysis ready for submission to a journal (final)	Month 9									■
	Deliverable 10: Powerpoint presentation: The PowerPoint presentation must summarize all outputs (protocols, systematic maps, systematic review) and key findings and takeaways for a lay audience (final)	Month 9									■

Audit trail

Details

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SIGNED	**Signed** by Zarrar Khan (zarrar@bristlep.com)	2025/11/26 21:14:25 UTC
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