



Introducing FAIR Scores in a Global Agricultural Science Reporting Service: An Analysis of the First Reporting Period

Sebastian S. Feger, Valentina De Col, Moayad AL-Najdawi, Juan Carlos Cadavid, Hector Tobon, German Martinez, Enrico Bonaiuti

About me: Sebastian S. Feger

- Computer Scientist
- Human-Computer Interaction (HCI) and User Experience Researcher
- Research Consultant at ICARDA/CGIAR
- Postdoc at LMU Munich
- Completed PhD Research on Designing for Reproducibility @CERN



Overview

- ICARDA/CGIAR and PRMS
- Introduction of FAIR Scores in PRMS
- Usage Analysis during the 1st Reporting Period
- Survey on FAIR Scores
- Next User-Centered Steps

Overview

- **ICARDA/CGIAR and PRMS**
- Introduction of FAIR Scores in PRMS
- Usage Analysis during the 1st Reporting Period
- Survey on FAIR Scores
- Next User-Centered Steps

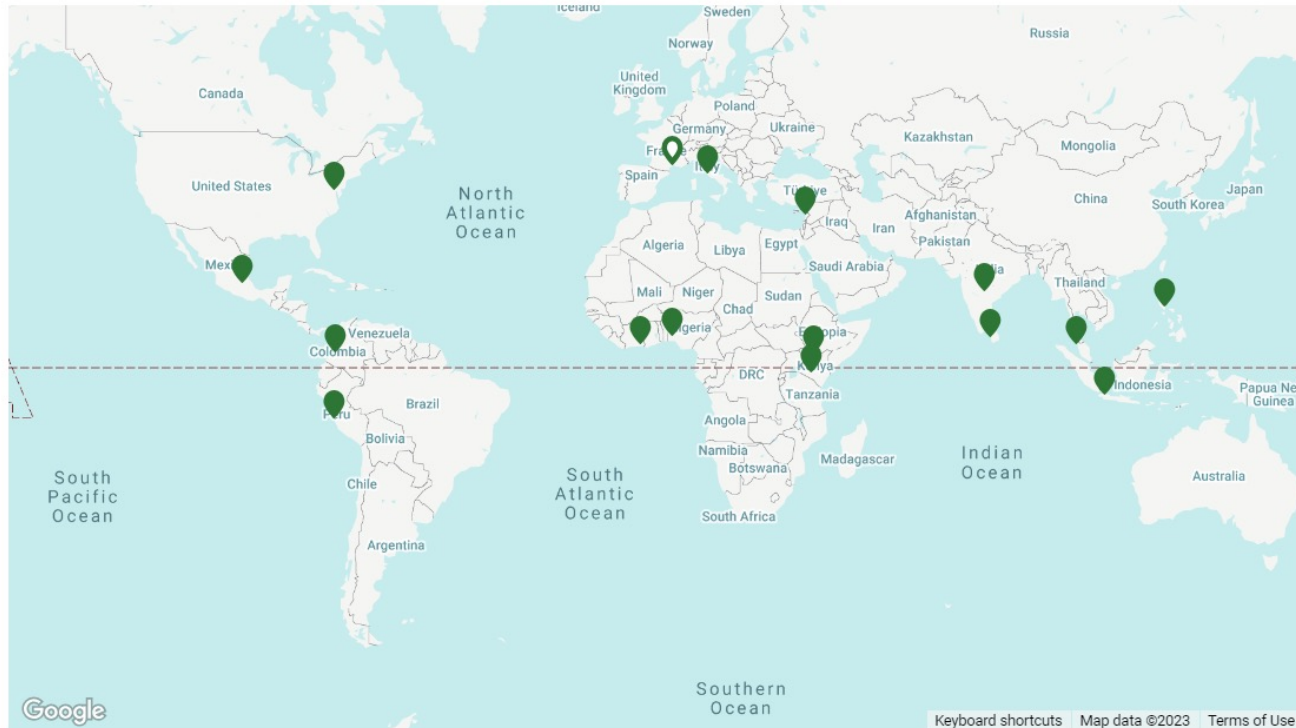
What is CGIAR?

CGIAR (formerly the Consultative Group for International Agricultural Research) is a **global research partnership for a food-secure future** dedicated to reducing poverty, enhancing food and nutrition security, and improving natural resources.



CGIAR's Centers Across the World

CGIAR's global research portfolio consists of 15 Centers located around the world



Africa Rice Center



Center for International Forestry Research (CIFOR)



International Center for Agricultural Research in the Dry Areas (ICARDA)



International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)



International Food Policy Research Institute (IFPRI)



International Institute of Tropical Agriculture (IITA)



International Livestock Research Institute (ILRI)



International Maize and Wheat Improvement Center (CIMMYT)



International Potato Center (CIP)



International Rice Research Institute (IRRI)



International Water Management Institute (IWMI)



The Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT)



World Agroforestry (ICRAF)



WorldFish

Performance and Results Management System (PRMS)

- Reporting tool introduced in late 2022
- Captures knowledge products such as journal articles, datasets, reports, and briefs

The screenshot displays the PRMS Reporting interface. At the top, the CGIAR logo and 'PRMS Reporting' title are on the left. Navigation links include 'Admin module >', a user profile for 'Valentina De Col' with an 'Admin' button, and a 'Logout' button. Below this is a dark navigation bar with 'Results' (highlighted), 'Type 1 report elements', 'Quality Assurance', and 'INIT Admin Module'. The main content area has tabs for 'Results' and 'Notifications'. A message box states: 'There is a possibility that the result you want to report has already been entered into the PRMS Reporting tool. If this is the case, it is only necessary to map the result to your Initiative. There is no need to enter it as a new result. Please use the results table below to ensure that your result has not been previously entered.' Below the message are filters for 'Submitter (s)' (All results, Pre-2022 results) and 'Reporting year' (2022, 2023, 2024). A 'Result level' section shows a hierarchy: Impact (Impact contribution), Action Area outcome (Policy change, Innovation use, Capacity change, Other outcome), Initiative outcome (Policy change, Innovation use, Capacity change, Other outcome), and Initiative output (Capacity sharing for development, Knowledge product, Innovation development, Other output).

PRMS Reporting

Admin module > Valentina De Col Admin Logout

Results Type 1 report elements Quality Assurance INIT Admin Module

Results Notifications

There is a possibility that the result you want to report has already been entered into the PRMS Reporting tool. If this is the case, it is only necessary to map the result to your Initiative. There is no need to enter it as a new result. Please use the results table below to ensure that your result has not been previously entered.

Submitter (s) Reporting year

All results Pre-2022 results 2022 2023 2024

Result level

Impact Action Area outcome Initiative outcome Initiative output


Impact contribution Policy change Innovation use Policy change Innovation use Capacity sharing for development

Capacity change Other outcome Capacity change Other outcome Knowledge product Innovation development

Other output

Overview

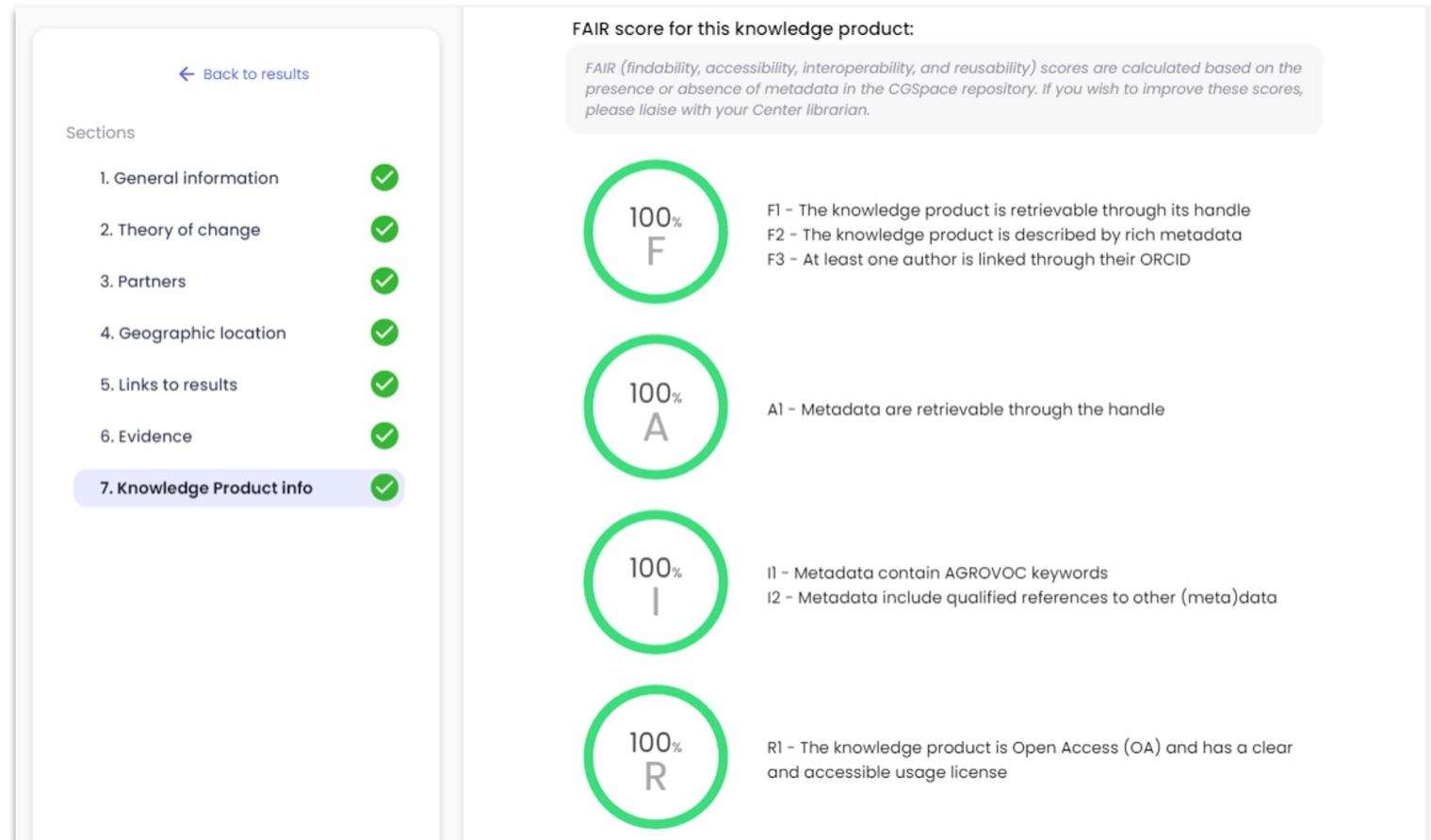
- ICARDA/CGIAR and PRMS
- **Introduction of FAIR Scores in PRMS**
- Usage Analysis during the 1st Reporting Period
- Survey on FAIR Scores
- Next User-Centered Steps



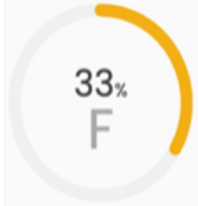
Key challenge: introduce community-wide
scoring that researchers **understand and accept**

PRMS and FAIR scores

- First-time introduction of **FAIR scores** (Findable, Accessible, Interoperable, Reusable)
- Based on **seven criteria** considered **easy to understand, follow, and review**

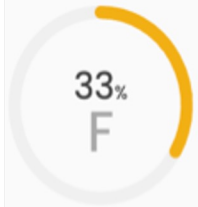


PRMS and FAIR scores



- ✓ F1 - The knowledge product is retrievable through its handle
- ✗ F2 - The knowledge product is described by rich metadata
- ✗ F3 - At least one author is linked through their ORCID

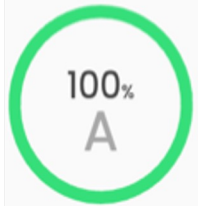
PRMS and FAIR scores



✓ F1 - The knowledge product is retrievable through its handle

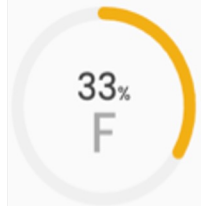
✗ F2 - The knowledge product is described by rich metadata

✗ F3 - At least one author is linked through their ORCID



✓ A1 - Metadata are retrievable through the handle

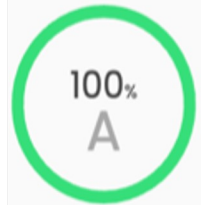
PRMS and FAIR scores



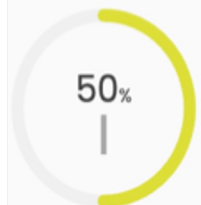
✓ F1 - The knowledge product is retrievable through its handle

✗ F2 - The knowledge product is described by rich metadata

✗ F3 - At least one author is linked through their ORCID



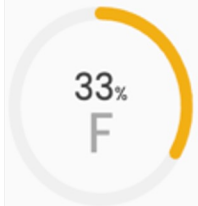
✓ A1 - Metadata are retrievable through the handle



✓ I1 - Metadata contain AGROVOC keywords

✗ I2 - Metadata include qualified references to other (meta)data

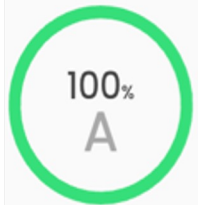
PRMS and FAIR scores



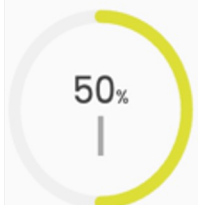
✓ F1 - The knowledge product is retrievable through its handle

✗ F2 - The knowledge product is described by rich metadata

✗ F3 - At least one author is linked through their ORCID

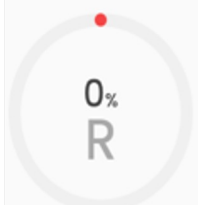


✓ A1 - Metadata are retrievable through the handle



✓ I1 - Metadata contain AGROVOC keywords

✗ I2 - Metadata include qualified references to other (meta)data



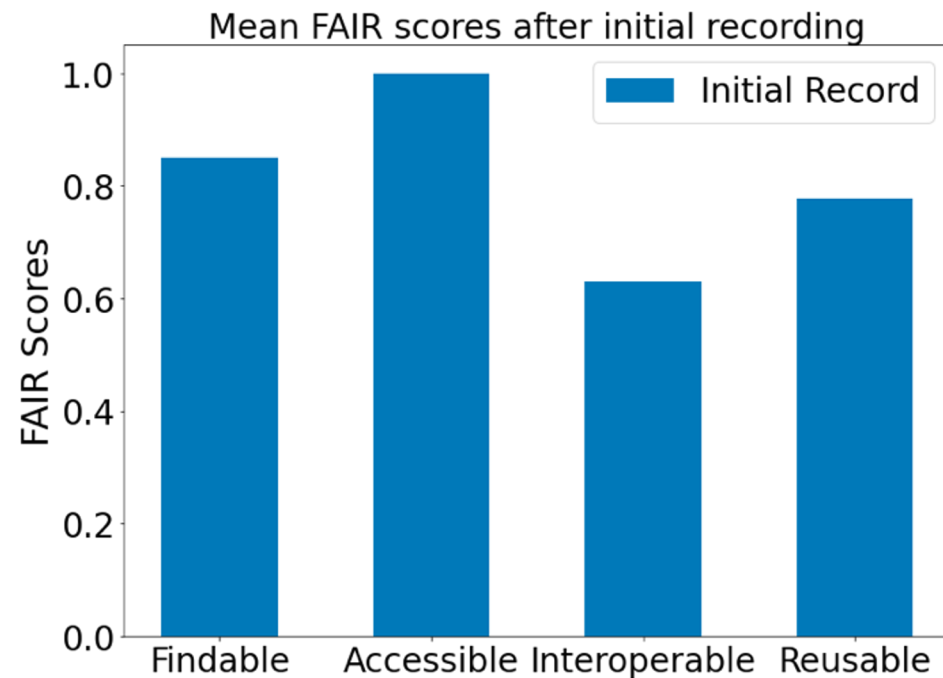
✗ R1 - The knowledge product is Open Access (OA) and has a clear and accessible usage license

Overview

- ICARDA/CGIAR and PRMS
- Introduction of FAIR Scores in PRMS
- **Usage Analysis during the 1st Reporting Period**
- Survey on FAIR Scores
- Next User-Centered Steps

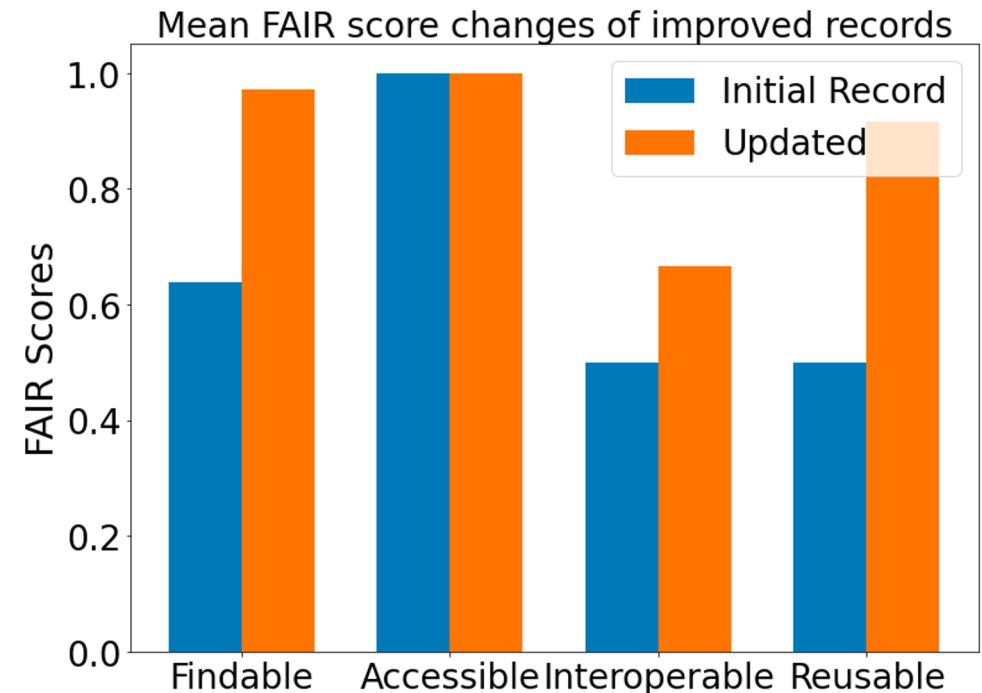
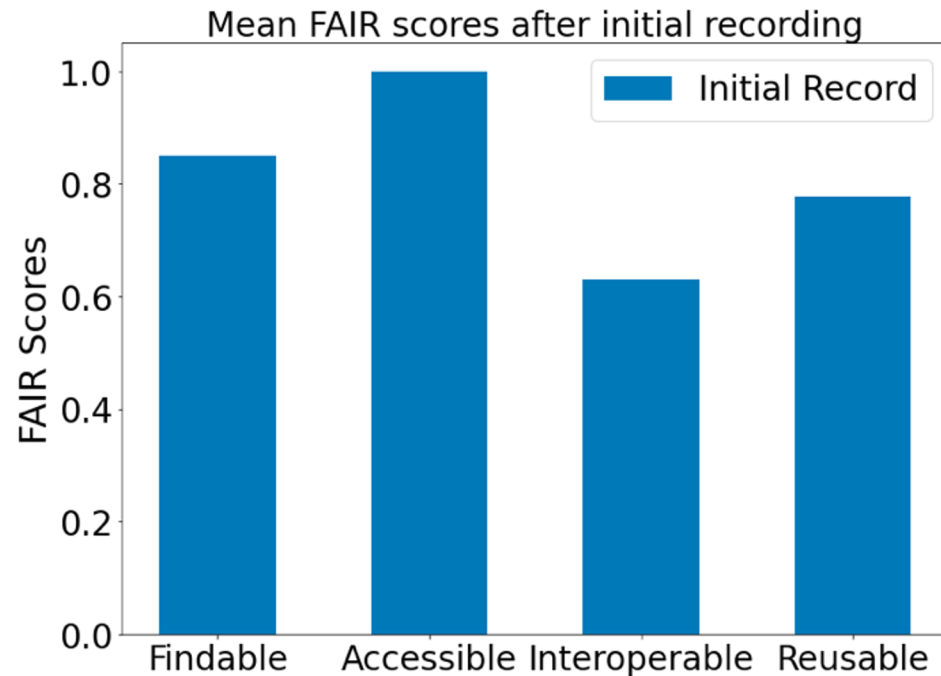
Usage Analysis

- Based on 418 complete datasets
- 163 records (39%) received at least one update
- 12 (3%) received an improved FAIR score



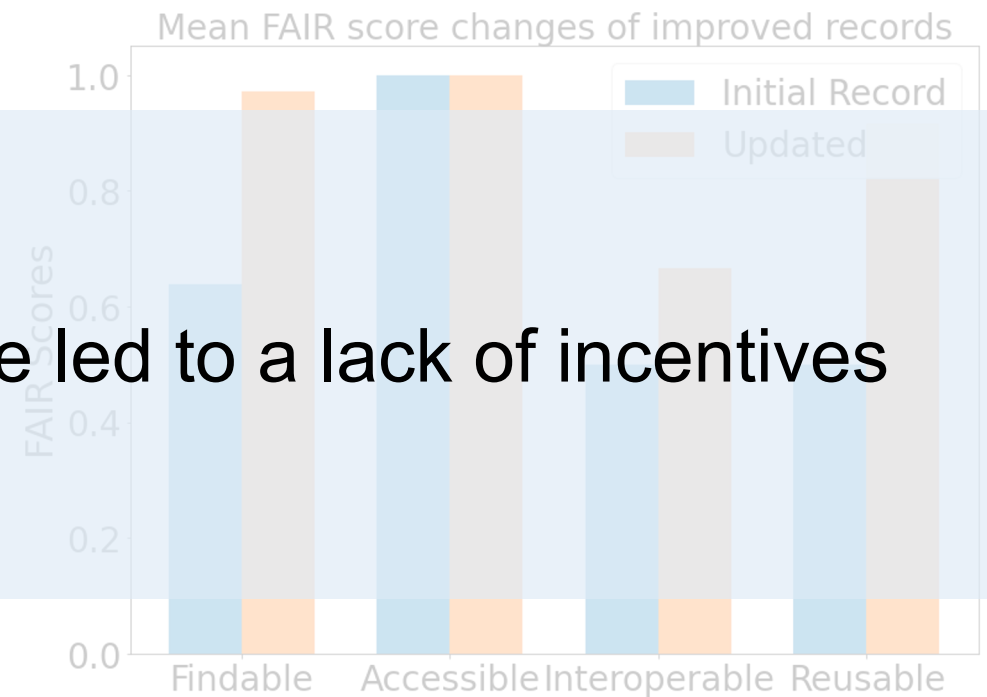
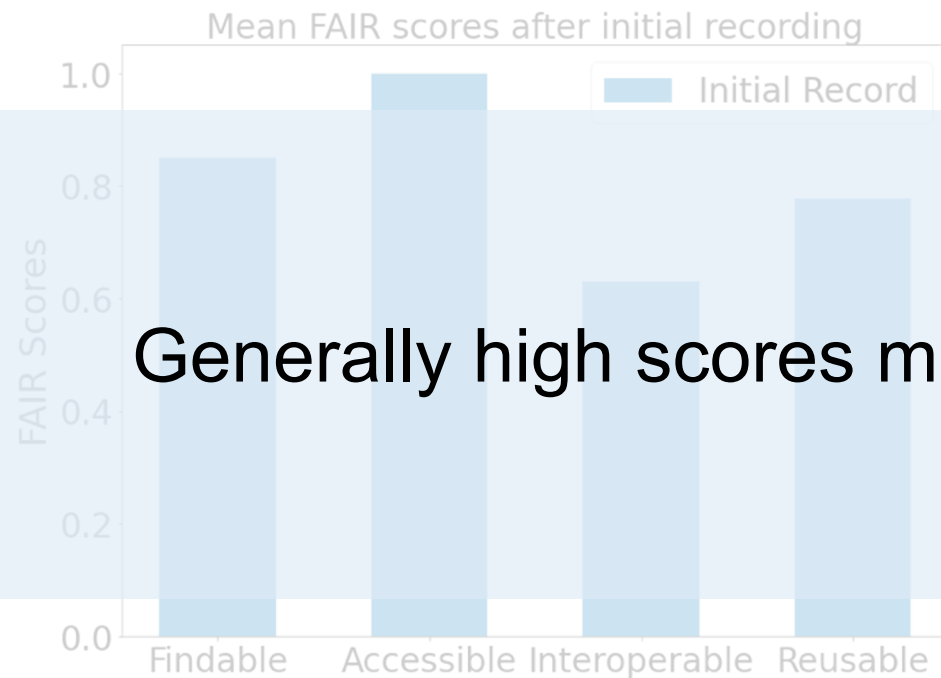
Usage Analysis

- Based on 418 complete datasets
- 163 records (39%) received at least one update
- 12 (3%) received an improved FAIR score



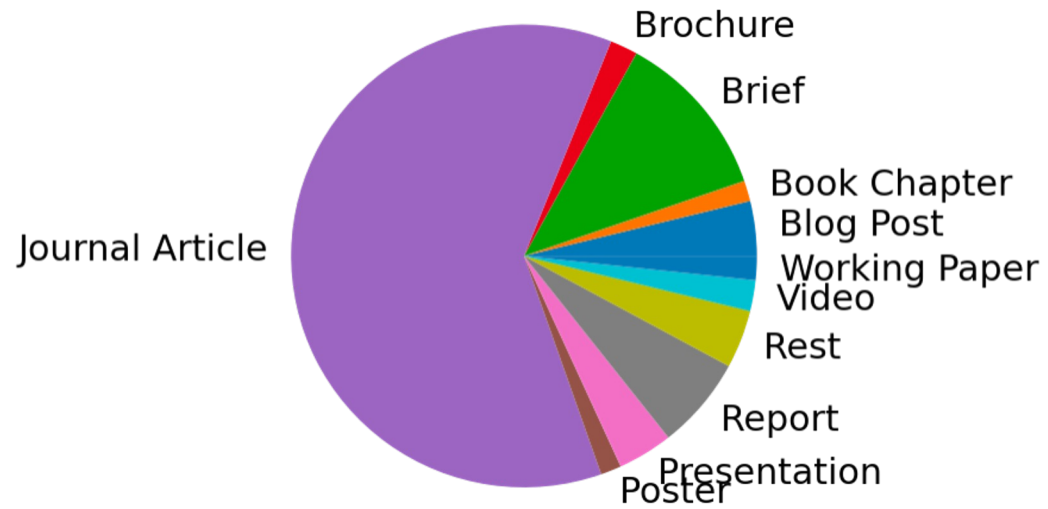
Usage Analysis

- Based on 418 complete datasets
- 163 records (39%) received at least one update
- 12 (3%) received an improved FAIR score

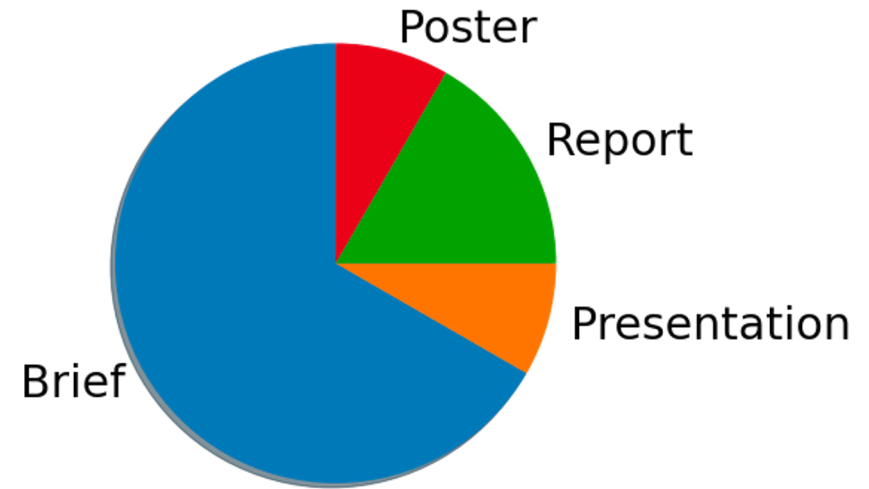


Generally high scores might have led to a lack of incentives

Knowledge product distribution



All records



Improved records

Overview

- ICARDA/CGIAR and PRMS
- Introduction of FAIR Scores in PRMS
- Usage Analysis during the 1st Reporting Period
- **Survey on FAIR Scores**
- Next User-Centered Steps

Survey Design

- Important tool to understand community perception and impact
- Invitation shared with 200 PRMS contributors
- 15 complete responses received (7,5%)

Survey

How many PRMS knowledge products have you reported/co-authored?	Average	Minimum	Maximum
How many knowledge products have you reported yourself on PRMS?	15.93	3.00	30.00

Survey

How many PRMS knowledge products have you reported/co-authored?	Average	Minimum	Maximum
How many knowledge products have you reported yourself on PRMS?	15.93	3.00	30.00
How many knowledge products reported on PRMS have you co-authored	2.14	0.00	19.00

Survey

View data: How many knowledge products with FAIR scores have you already viewed in the PRMS? ×

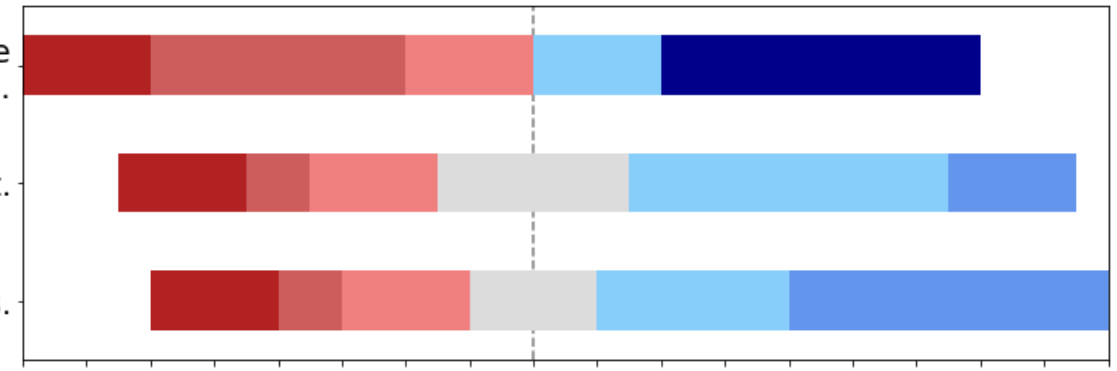
How many knowledge products with FAIR scores have you already viewed in the...	Average	Minimum	Maximum	Count
Please provide a rough estimate	15.33	0.00	90.00	15

FAIR and Data Management *Knowledge*

I have not known about the FAIR principles before seeing the FAIR scores in the PRMS.

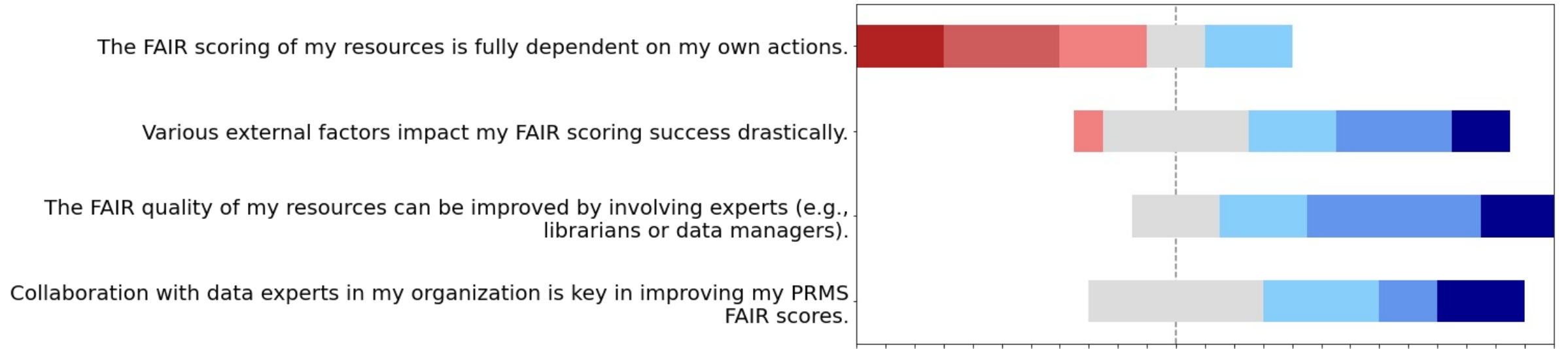
The FAIR scores impacted my knowledge of data management.

I understand how the FAIR principles relate to the One CGIAR data policies.



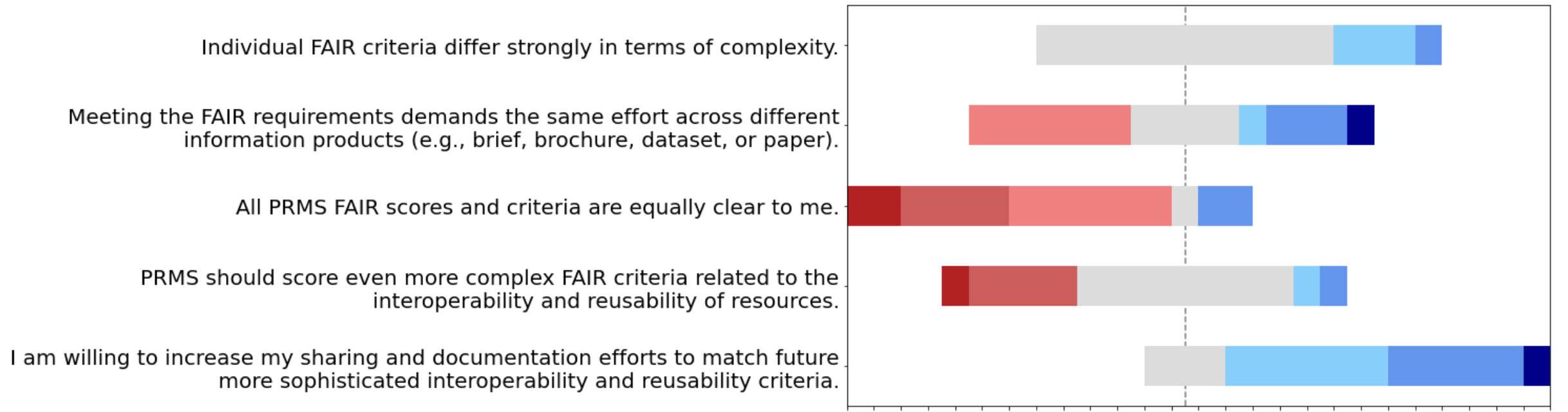
Strongly Disagree **Disagree** **Somewhat Disagree** **Neutral** **Somewhat Agree** **Agree** **Strongly Agree**

Control over FAIR Scores



Strongly Disagree **Disagree** **Somewhat Disagree** **Neutral** **Somewhat Agree** **Agree** **Strongly Agree**

FAIR Differences and Complexity



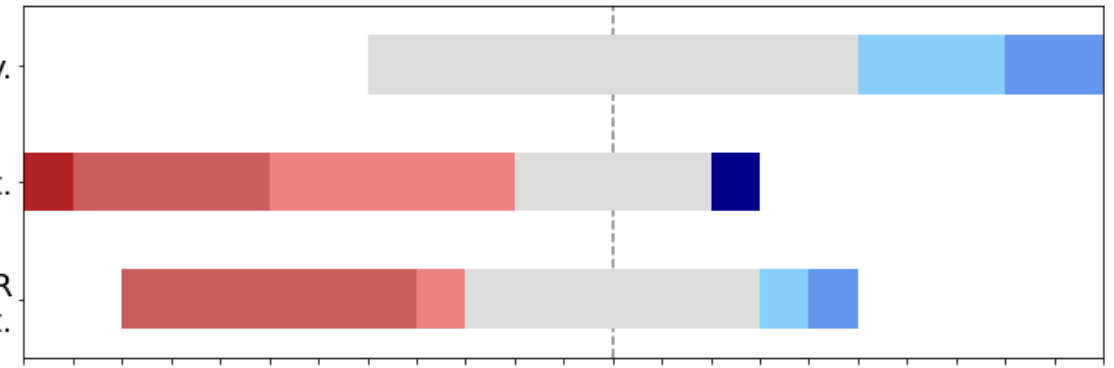
Strongly Disagree **Disagree** **Somewhat Disagree** **Neutral** **Somewhat Agree** **Agree** **Strongly Agree**

Research *Impact*

The FAIR scores in the PRMS represent my data management efforts correctly.

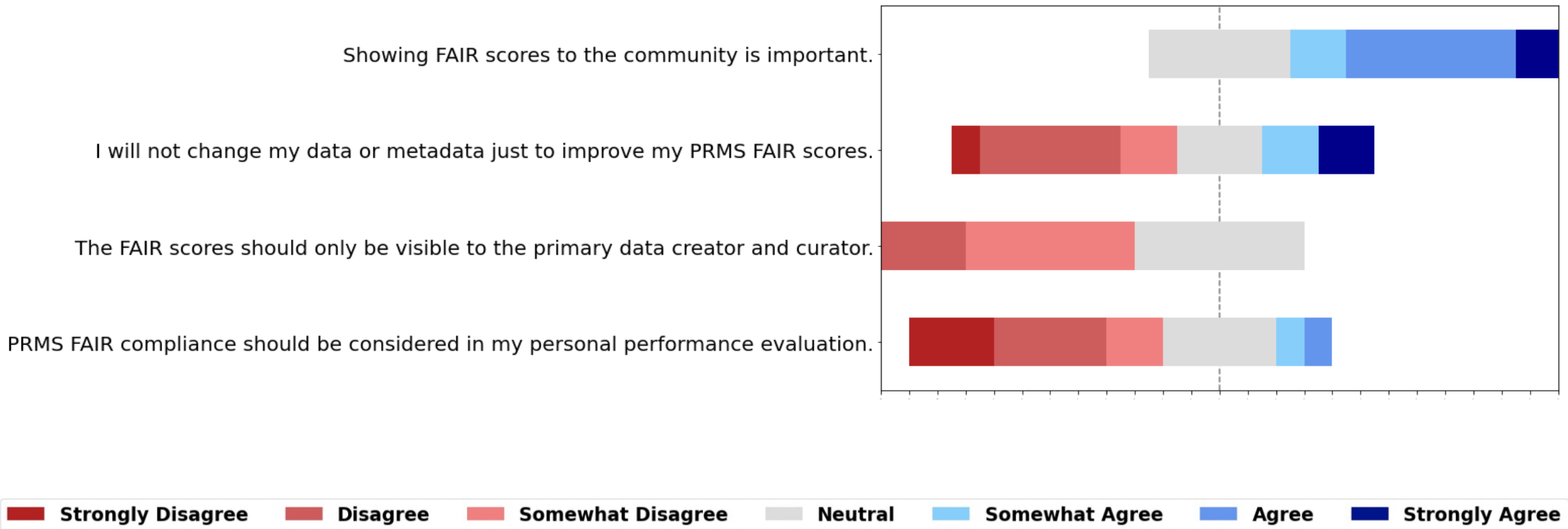
I do not expect PRMS FAIR scores to improve overall data management.

My research will not benefit from others making their research data FAIR compliant.



Strongly Disagree **Disagree** **Somewhat Disagree** **Neutral** **Somewhat Agree** **Agree** **Strongly Agree**

Transparency



Overview

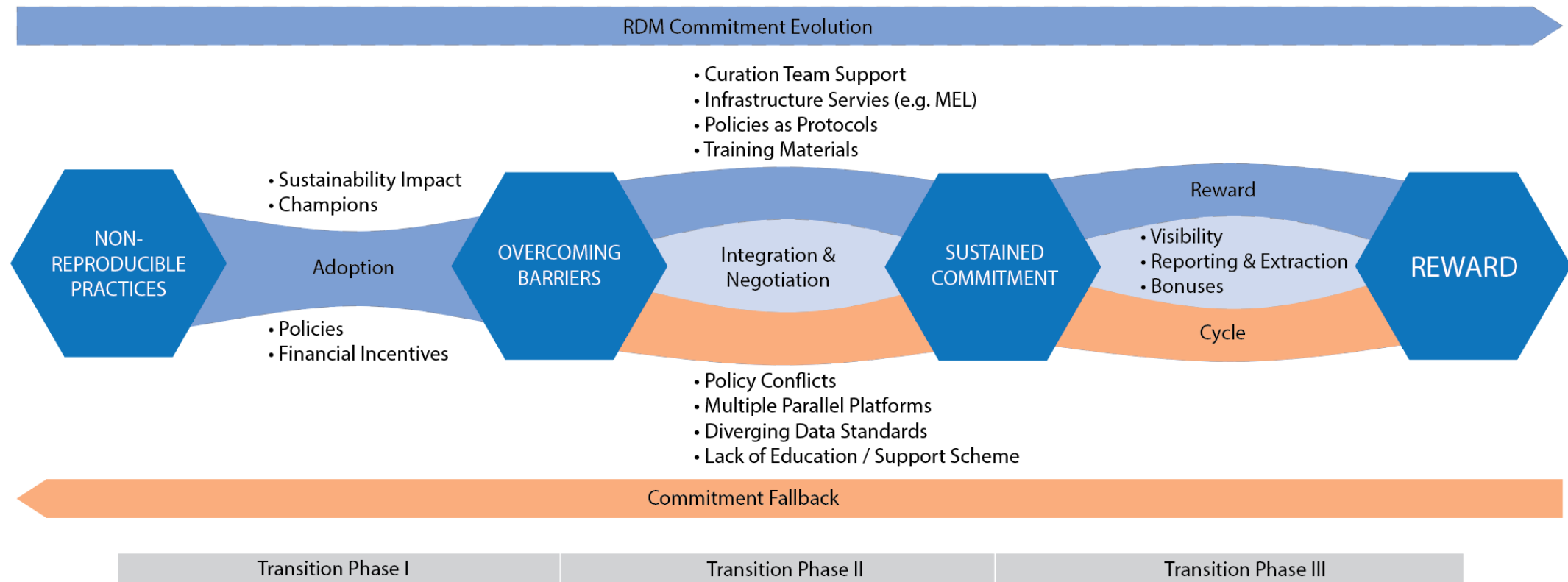
- ICARDA/CGIAR and PRMS
- Introduction of FAIR Scores in PRMS
- Usage Analysis during the 1st Reporting Period
- Survey on FAIR Scores
- **Next User-Centered Steps**

Next User-Centered Steps

- Further user feedback needed: interviews, focus groups, surveys, ...
- Close monitoring of future reporting periods
- Investigate the impact of lower / higher initial FAIR scores
- Explore mechanisms to address more complex FAIR concepts (in particular IR)

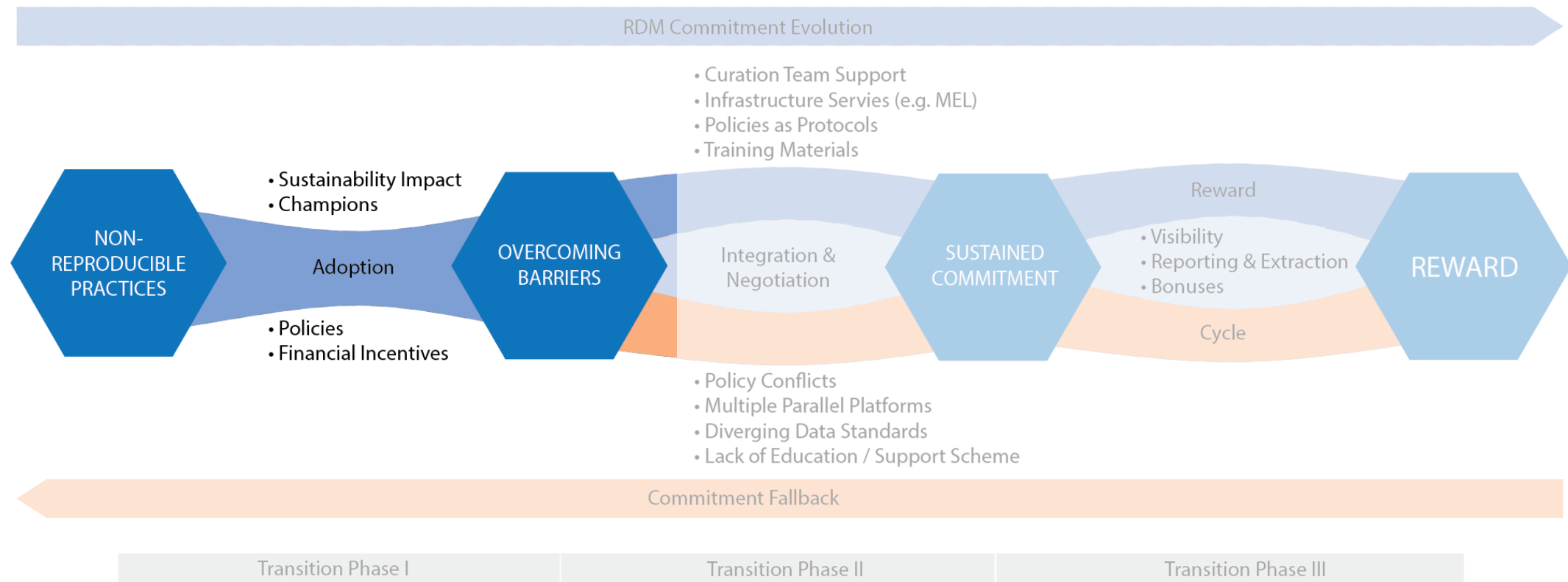
Next User-Centered Steps

Reason about findings in the context of related work



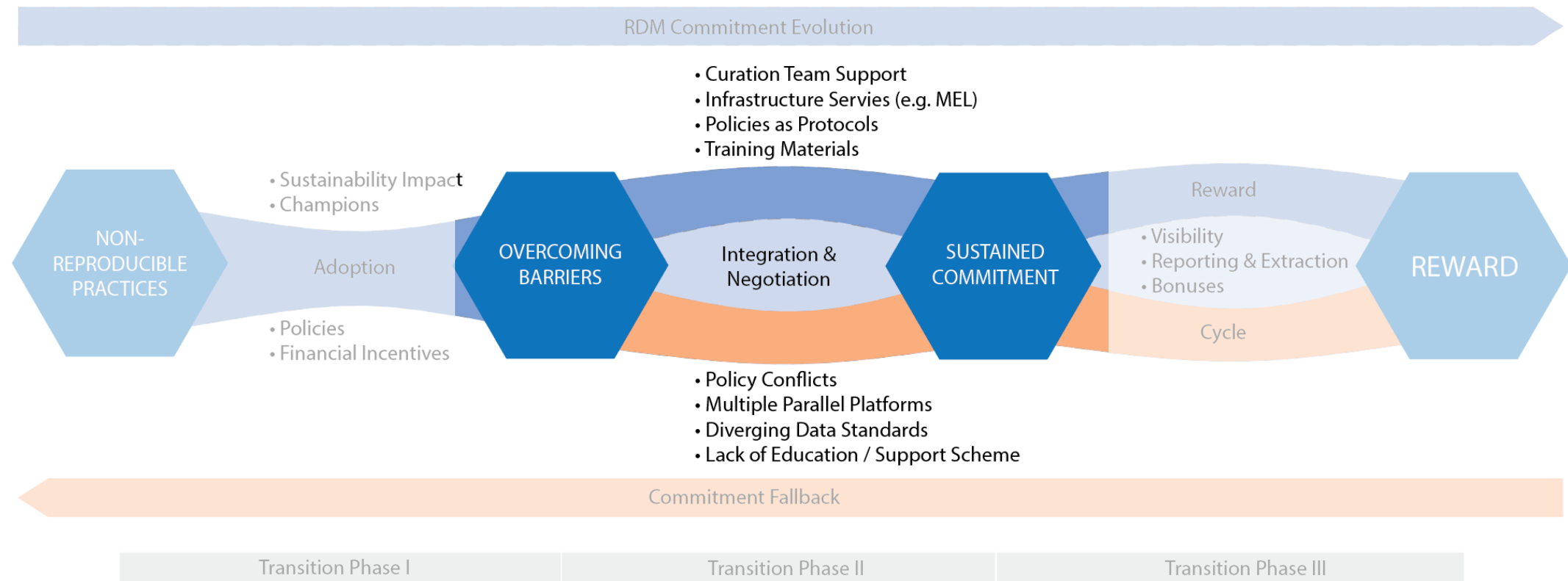
Next User-Centered Steps

Reason about findings in the context of related work



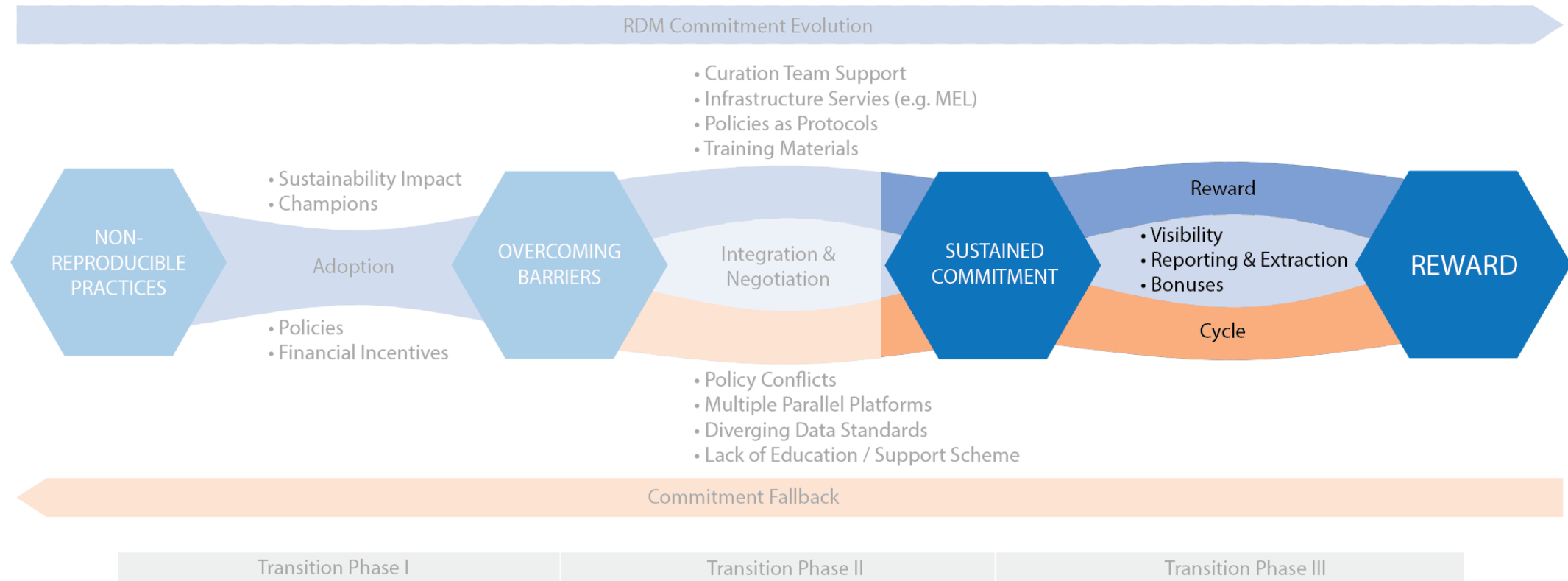
Next User-Centered Steps

Reason about findings in the context of related work



Next User-Centered Steps

Reason about findings in the context of related work



Next User-Centered Steps

Reason about findings in the context of related work: **General vs. Tailored Rewards**



Center for Open Science: Open Science Badges

Kidwell, Mallory C., et al. "Badges to acknowledge open practices: A simple, low-cost, effective method for increasing transparency." *PLoS biology* 14.5 (2016): e1002456.

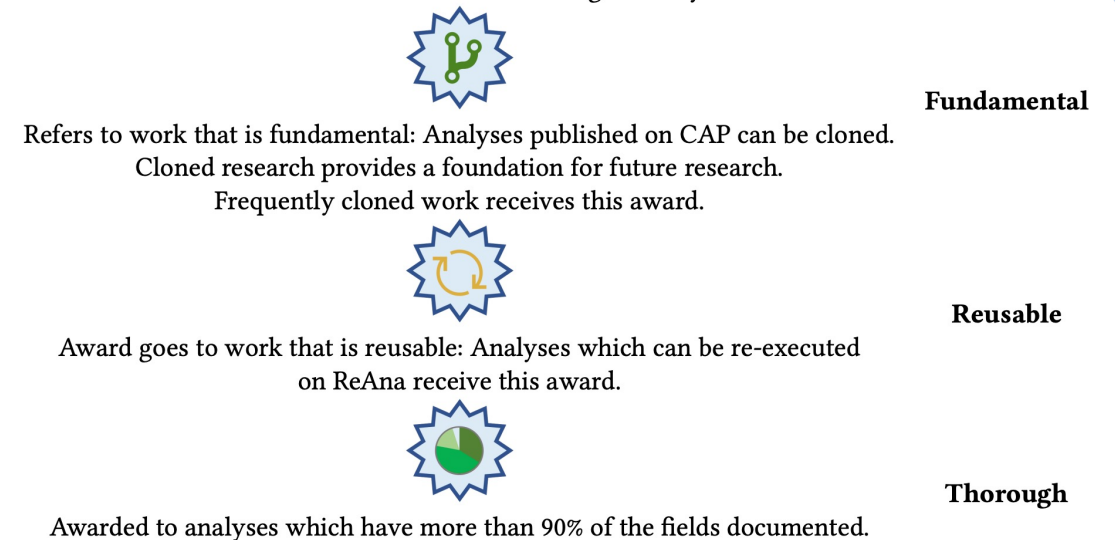
Next User-Centered Steps

Reason about findings in the context of related work: **General vs. Tailored Rewards**



Center for Open Science: Open Science Badges

Kidwell, Mallory C., et al. "Badges to acknowledge open practices: A simple, low-cost, effective method for increasing transparency." *PLoS biology* 14.5 (2016): e1002456.



Tailored Science Badges

Feger, Sebastian Stefan, et al. "Tailored Science Badges: Enabling New Forms of Research Interaction." *Designing Interactive Systems Conference 2021*. 2021.

Conclusion

- We reported on the 1st PRMS reporting period with FAIR scores
- Usage analysis: 39% of records got updated; 3% of records got better FAIR scores
- Survey: the community is willing to improve, but recognizes grand challenges
- Need for further user feedback, improved FAIR scores, and usage monitoring
- Opportunity to connect to related work, e.g. user-centered models and gamification

Thank you