

Practising Open Science while working with data from different knowledge systems in a just and proper way.

Can data be FAIR & CAREful?

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Introduction

High standards and transparency are vital for the Intergovernmental Science-Policy Platforms for Biodiversity and Ecosystem Services (IPBES). The FAIR Guiding Principles for scientific data management and stewardship (**F**indability, **A**ccessibility, **I**nteroperability and **R**eusability) promote measurable transparency, while the CARE Principles for Indigenous Data Governance (**C**ollective benefit, **A**uthority to control, **R**esponsibility and **E**thics) ensure just handling of Indigenous and Local Knowledge (ILK). Both are essential for holistic, sustainable and effective decision-making in biodiversity. They are integral to IPBES's Data and Knowledge Management Policy, though their interplay was previously unexamined.

Key messages

1. The FAIR Principles **F**indability and **R**eusability synergize well with all CARE Principles, while CAREs **R**esponsibility and **E**thics enhance all FAIR Principles;
2. Trade-offs exist between FAIRs **A**ccessible with CAREs **C**ollective benefit and **A**uthority to control at the data level. At the metadata level these principles can be implemented independently from each other;
3. There are easily implementable practical solutions to address these trade-offs.

The CARE Principles for Indigenous Data Governance

	C	A	R	E	
F	✓	✓	✓	✓	All sub-Principles on F indability, such as the provision of a persistent unique identifier, enhances all CARE Principles
A	✗	✗	✓	✓	Two trade-offs, between A ccessibility and CAREs C ollective benefit and A uthority to control, were identified.
I	✓	✓	✓	✓	Interoperability and C ollective benefit can be implemented independently, all other Principles enhance each other
R	✓	✓	✓	✓	All sub-Principles on R eusability, such as the detailed provenance and accessible data usages license, enhance all CARE Principles

The FAIR Guiding Principles for scientific data management and stewardship

Methods

A comprehensive matrix of all 180 FAIR and CARE sub-Principle pairs was developed. Each combination was assessed for synergy, independence or trade-off within IPBES. Identified trade-offs were pinpointed at the data or metadata levels, in order to come up with potential solutions. The matrix, displayed on the left, colour-codes Principle combinations based on the predominant sub-Principle relationship: synergies are displayed in green, independence in yellow, and trade-offs in red. Given the project's goal to address trade-offs, each identified one is highlighted in the matrix.

Proposed solutions

Currently, IPBES does not concurrently implement **C**ollective benefit and **A**uthority to control. ILK sourced from dialogue meetings may be included or excluded from an assessment, leaving Indigenous participants without control over their contributed data. Furthermore, unused data is often lost.

To address these challenges:

1. Any ILK not incorporated into an assessment should be published, ensuring its accessibility and preserving its **C**ollective benefit;
2. Indigenous contributors from the dialogue meetings should be invited to review assessment drafts, giving them insight into data usage and an opportunity to correct inaccuracies, thereby upholding the **A**uthority to Control.

Discussion

Data can be FAIR and CAREful. IPBES assessments already perform up to a high standard of practicing FAIR and CARE. The next phase should involve a revision of the IPBES Delivery Protocol of the Assessment Drafts to integrate the FAIR Maturity Model, a way to quantify FAIRness, and the distinct CARE Principles. This ensures measurable FAIR and CARE implementation within IPBES, providing insights in the progress to complete FAIRness and CAREfulness by 2030. As the first intergovernmental platform recognising the importance of ILK and systematically engaging with it, IPBES can set the gold standard for other platforms and organisations.

