

SC4 Report to AIFOD Committee – Sustainable Impact & Long-term Development Standards

Committee Name: SC4 – Sustainable Impact & Long-Term Development

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1. Executive Summary

This report defines SC4’s framework for embedding sustainability and long-term development into AI deployment through 47 indicators across social, cultural, environmental, and economic dimensions. The framework aligns with the SDG 2030 Agenda and draws from best practices in OECD’s results-based systems and capacity-building programs to support transformation in developing countries. It proposes adaptive timeframes, community-led monitoring, and ownership models built into AIFOD certification standards.

1.2. Sustainable Impact Dimensions

Dimension	Focus
Social	Equity in education, health, inclusion, rights, digital access, and service continuity.
Cultural	Language transmission, heritage protection, community storytelling, co-authorship.
Environmental	AI lifecycle emissions, biodiversity resilience, climate risk mitigation, energy source mix.
Economic	Local value creation, employment equity, SME supply integration, fiscal contributions.

1.3. Strategic Timeframes

Time Horizon	Focus Areas
Short-Term (0–3 yrs)	Environmental compliance, digital inclusion, baseline trust, pilot implementation.

Mid-Term (3–10 yrs)	Institutional adaptation, localized skill development, tech governance.
Long-Term (10–30 yrs)	Intergenerational equity, ecosystem repair, cultural revitalization, autonomy.

1.4. Indicator Dashboard (47 Total)

Social (16): Digital literacy, health worker retention, gender index, safety and trust metrics.

Cultural (10): Indigenous language education, elder engagement, creative IP protection.

Environmental (14): Emissions per model, renewable % in AI infrastructure, biodiversity metrics.

Economic (7): Job creation, SME integration, circularity rates, local economic reinvestment.

Each indicator has:

- **Defined Metrics** (quantitative/qualitative)
- **Time-bound goals**
- **Baseline vs. projection targets**
- **Community empowerment indicators**

1.5. Monitoring, Ownership & Evaluation

Evaluation Design: Based on OECD results framework logic (input → output → outcome → impact).

Capacity-Building:

- Aligned to SDG 17.9: Inclusive national plans, North–South cooperation.
- Programs for AI literacy, local auditing, and policy formulation.

Monitoring Tools:

- Dashboard reporting (digital-first)
 - Local storytelling and feedback loops
 - Biennial external audits, annual progress updates
 - Data disaggregation for "Leave No One Behind" (LNOB) tracking.
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1.6. Integration into AIFOD FAIR Certification

FAIR Alignment:

- **F:** Feedback loops from communities
- **A:** Accountability via participatory governance
- **I:** Inclusion through contextualized empowerment metrics
- **R:** Resilience via intergenerational indicators

Implementation Phases:

- Pre-launch baselining
- Midterm evaluations (3- and 10-year cycles)
- Long-term transformation tracking (20–30 years horizon)

2. SC4 Impact Dashboard

2.1. Social Dimension

Indicator	Measurement Focus	Timeframe
Digital Skills Index	% of population with functional digital literacy	Short (0–3 yrs)
Gender Inclusion Ratio	Participation in STEM and AI training by gender	Mid (3–10 yrs)
Community Participation Rate	Roles in decision-making boards	Mid (3–10 yrs)
Health & Education Access	Facilities and professional retention levels	Long (10–30 yrs)
Trust & Safety Perception	Community-based surveys and feedback tools	Ongoing

2.2. Cultural Dimension

Indicator	Measurement Focus	Timeframe
Indigenous Language Instruction Hours	Formal and informal use in education	Short (0–3 yrs)
Heritage Preservation Metrics	Digital archives, physical site protection	Mid (3–10 yrs)
Cultural Innovation Index	Hybrid content creation and cultural startups	Mid (3–10 yrs)
Elder-Informed Curriculum Inclusion	Program design with intergenerational elements	Long (10–30 yrs)

IP Rights in Traditional Knowledge	Shared authorship and legal protection	Ongoing
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2.3. Environmental Dimension

Indicator	Measurement Focus	Timeframe
CO ₂ Emissions per AI Model	Lifecycle assessment in tons	Short (0–3 yrs)
Renewable Energy Share	% of energy from sustainable sources	Mid (3–10 yrs)
E-waste Reuse and Diversion Rate	Circular infrastructure performance	Mid (3–10 yrs)
Biodiversity Recovery Index	Local species return and ecosystem health	Long (10–30 yrs)
Water Use per Deployment	Resource efficiency per infrastructure site	Ongoing

3. SC4 Monitoring Charter for Sustainable A Implementation

Aligned with OECD Results Toolkit & AIFOD FAIR Certification

3.1. Purpose

To establish transparent, inclusive, and accountable monitoring mechanisms that evaluate the social, cultural, environmental, and economic sustainability of AI systems in developing regions. This Charter enables adaptive learning, fair oversight, and policy feedback in line with OECD RBM and the SDG 2030 Agenda.

3.2. Principles

- **Transparency:** All monitoring results must be open to affected communities and stakeholders.
- **Participation:** Local actors are co-designers and co-monitors of sustainability indicators.
- **Evidence-Based:** Data collection and evaluation align with global sustainability standards.
- **Adaptability:** Monitoring systems must evolve with local needs and project learning.
- **Equity & Inclusion:** Monitoring must highlight the outcomes for marginalized groups.

3.3. Responsibilities & Roles

Actor	Role
AIFOD SC4 Committee	Oversight, alignment with FAIR standards
Local Monitoring Units	Data collection, community feedback coordination
Regional Auditor Pool	Independent verification (3-year cycle)
Project Implementers	Reporting, compliance, and adaptation
Beneficiary Communities	Validation, feedback, participation in reviews

3.4. Monitoring Phases

Phase	Scope	Timeframe
Baseline	Context mapping, indicator calibration	Before launch

Short-Term Review	Implementation progress, immediate effects	1–3 years
Mid-Term Evaluation	Structural/systemic change	3–10 years
Long-Term Impact Assessment	Intergenerational effects, autonomy	10–30 years

3.5. Tools & Methods

- **Indicator Dashboard** (47 total): Regular updates with disaggregated data.
 - **Community Storytelling**: Narrative-based monitoring to track lived experience.
 - **Surveys & Digital Logs**: Structured tools for social and cultural tracking.
 - **Environmental Modeling**: Data tools for emissions, biodiversity, circularity.
 - **Audit Trails & Metadata Checks**: Verifying AI lifecycle compliance.
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3.6. Data Ethics & Sovereignty

- Data is owned by the communities that generate it.
- Free, prior, and informed consent is required.
- AI systems must log data access and use patterns transparently.

3.7. Review and Learning

- Annual internal reviews + Biennial learning workshops.
- Data shared through open platforms (where safe and appropriate).
- Adaptive indicators: KPIs may be recalibrated every 5 years in response to contextual shifts.

4. SC4 Draft Indicator Manual for Sustainable Impact & Long-term Development

Version: Pre-Vienna Draft (July 2025)

Developed by: SC4 Sub-Groups (Social, Cultural, Environmental, Economic)

Purpose: To guide indicator usage across AI development projects with respect to sustainable impact and long-term development.

4.1. Structure of Each Indicator

Each indicator entry includes:

- **Name**
- **Definition**
- **Measurement Method**
- **Timeframe** (Short: 0–3 yrs, Mid: 3–10 yrs, Long: 10–30 yrs)
- **Dimension(s)** covered
- **Alignment** (SDG target or international framework where applicable)

4.2. Social Indicators (16)

Indicator	Definition	Timeframe	Method
Digital Skills Index	% of population with foundational digital literacy	Short	National survey
Gender Inclusion Ratio	Female/minority participation in STEM/AI programs	Mid	Enrollment tracking

Community Participation Rate	% of local people in governance or oversight roles	Mid	Project audits
Health Access Equity	Differential access to care by gender and region	Mid	Health data review
Teacher Retention Rate	% retained after 3 years in under-resourced areas	Long	HR records
AI Safety Perception Index	Trust levels in AI systems in public life	Mid	Perception survey

4.3. Cultural Indicators (10)

Indicator	Definition	Timeframe	Method
Indigenous Language Use	% of learning hours in local/heritage languages	Short	School records
Heritage Content Digitized	Total hours of cultural knowledge digitized	Mid	Digital archives
Elder Participation in Curriculum	# of elders in content creation or co-teaching	Mid	Project documentation
Creative Innovation Index	# of culturally grounded new works or hybrid formats	Mid	Arts and IP reports

IP Rights Shared with Communities	% of cultural AI systems with local IP ownership	Long	IP registry
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4.4. Environmental Indicators (14)

Indicator	Definition	Timeframe	Method
CO ₂ Emissions per AI Model	Energy consumed per inference/training cycle	Short	LCA analysis
Renewable Energy Share	% of AI systems powered by renewables	Mid	Energy provider data
Water Use per AI Facility	Liters used per compute unit or server	Mid	Facility logs
Biodiversity Recovery Index	Net gain in species or habitat health near project zones	Long	Ecological monitoring
Circular Tech Use Rate	% reused/recycled AI components	Mid	Procurement audits

4.5. Economic Indicators (7)

Indicator	Definition	Timeframe	Method
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Local Employment Creation	# of jobs created locally	Short	Employer reports
SME Supply Chain Participation	% contracts to local SMEs	Mid	Procurement records
Fiscal Contribution Index	Taxes and fees paid in-country	Mid	Financial statements
Innovation from Local Actors	# of patents/startups involving national contributors	Long	Patent & registry data
Reinvestment Ratio	% of revenue reinvested in community programs	Mid	Budget reports

4.6. Education Indicators (New Dimension, 8 Indicators)

Indicator	Definition	Timeframe	Method
AI Literacy Rate	% of population able to critically understand AI technologies	Short–Mid	National surveys
Curriculum Localization Rate	% of educational content adapted to local languages and cultures	Mid	Curriculum audits
STEM Education Access	Ratio of students in AI/STEM fields, by gender and region	Mid	Enrollment data

Teacher Digital Capacity Index	% of teachers trained in digital and AI-integrated methods	Short–Mid	HR & training records
Educational Retention Rate	% of students completing secondary-level education	Mid–Long	Ministry of Education stats
Technical & Vocational Skill Uptake	Enrollment in AI/tech training programs by local youth	Mid	Program participation data
School Infrastructure Readiness	% of schools with digital access, electricity, safe spaces	Short–Mid	Infrastructure audits
Intergenerational Learning Index	Degree of cross-age group participation in tech education	Mid–Long	Community feedback surveys

4.7. Reporting Tools

- **Indicator Dashboard** (for real-time data)
- **Narrative Summary Logs** (qualitative context)
- **Third-Party Auditor Scorecards** (verification)
- **Community Survey Forms** (feedback loops)

5. AIFOD Empowerment Appendix

For Sustainable AI Implementation in Developing Countries

This part is compiled based on SC4's empowerment framework, OECD principles, and your documented subgroup contributions. This appendix is designed to accompany the Vienna deliverables and serve as a guideline for ensuring that AI systems foster genuine, inclusive, and long-term empowerment in developing countries.

5.1. Purpose

This appendix defines empowerment not only as increased access or participation, but as **a structural shift in agency**, ownership, and decision-making in the development and governance of AI systems. It provides a framework for identifying, measuring, and enhancing empowerment throughout AI project lifecycles.

5.2. Definition of Empowerment

Empowerment is the **capacity of individuals and communities to influence, control, and benefit from AI systems** in ways that respect local knowledge, foster autonomy, and sustain collective well-being across generations.

5.3. Empowerment Dimensions

Dimension	Definition
Access	Ability to use and engage with AI tools and platforms (e.g., connectivity, skills)
Participation	Involvement in design, oversight, and evaluation processes
Autonomy	Capacity to make independent decisions about AI use, development, and data
Innovation	Ability to develop and apply AI tools for self-defined goals

Recognition Cultural, political, and legal acknowledgment of community agency and knowledge

5.4. Empowerment Indicators (Cross-cutting all 4 SC4 dimensions)

Indicator	Measurement	Timeframe
% Local Staff in Leadership Roles	HR data from project teams	Mid
Co-Design Participation Rate	# of community members in design workshops	Short
Community Consent Satisfaction Index	Survey-based feedback on consent processes	Short
IP Co-Ownership Agreements	% of outputs with shared or local IP rights	Mid
Locally Led AI Projects	# of innovations initiated by local actors	Long
AI Literacy Improvement	% increase in understanding AI concepts	Short–Mid

5.5. Implementation Guidelines

- Conduct **Empowerment Baselines** before AI project initiation.
- Integrate **feedback loops** into all decision-making processes.

- Use **participatory indicators** co-developed with communities.
- Ensure **data sovereignty** and transparency in access and control.
- Provide **legal and technical support** for IP negotiation and rights defense.

5.6. Review & Adaptive Learning

- **Annual community audits** on empowerment status.
- Empowerment indicators should be revisited **every 3–5 years** to reflect social and technological changes.
- Learning from empowerment failures must inform **project redesign**.

5.7. Alignment with AIFOD FAIR Framework

- ***F – Feedback:*** Empowerment is monitored via community-led evaluations.
- ***A – Accountability:*** Power imbalances are redressed through participatory oversight.
- ***I – Inclusion:*** Marginalized voices are centered in design and governance.
- ***R – Resilience:*** Empowerment is framed for continuity, not dependency.