



# CISAMS

## **Deliverable 3: Social sustainability indicators list and scoring mechanism**

**Greece 2.0**

**Basic Research Financing Action  
(Horizontal support of all Sciences)**

**Sub-action 1: Funding New Researchers**

**M13**

## Document control sheet

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REVISION HISTORY			
Version	Date	Author(s)	Changes made
0.1	01/09/2024	Athanasios Rentizelas, Eleni Aretoulaki, Kostas Florios	Initial structure drafted; methodology framework outlined; Scopus search query defined.
0.2	01/11/2024	Eleni Aretoulaki	Desk research completed; 128-paper dataset compiled; longlist of indicators extracted and categorized.
0.3	15/12/2024	Eleni Aretoulaki	Filtering criteria applied; qualitative indicators removed; consolidation into final 40 indicators; preliminary category descriptions drafted.
0.4	15/01/2025	Kostas Florios, Efthymios Simos	BBWM weighting methodology integrated; mathematical formulation added; code implementation aligned with Deliverables 1 & 2.
0.5	28/01/2025	Kostas Florios, Efthymios Simos	PROMETHEE II scoring section drafted; payoff table and ranking analysis added.
0.6	15/02/2025	Athanasios Rentizelas, Eleni Aretoulaki, Kostas Florios	Discussion and Implications sections completed; limitations added; cross-referencing to D1–D2 aligned.
0.9	15/03/2025	Athanasios Rentizelas, Eleni Aretoulaki, Kostas Florios	Final technical review; consistency edits; figure captions and table formatting finalized.
1.0	31/03/2025	Athanasios Rentizelas, Eleni Aretoulaki, Kostas Florios	Final version submitted; quality check, proofreading, and redaction completed.

# 1 EXECUTIVE SUMMARY

This deliverable presents the outcomes of the third work package (WP3), titled “**Social Sustainability Assessment**”, which aims to develop a comprehensive shortlist of social sustainability indicators and design a structured scoring mechanism for evaluating the social performance of manufacturing systems.

The deliverable outlines the systematic methodology employed to identify, assess and refine social sustainability indicators from an initial longlist derived from the academic literature. A targeted Scopus search retrieved **128 papers** related to social sustainability; after screening for relevance and sectoral applicability, **44 papers** were retained for full review. From these, a longlist of **78 distinct social sustainability indicators** was extracted, spanning qualitative, quantitative and composite measures.

A multi-stage refinement process was then applied. Purely qualitative indicators were removed to ensure operational measurability, and overlapping indicators were consolidated into broader constructs such as inclusive employment practices. This process resulted in a final shortlist of **40 quantitative, composite, and semi-quantitative indicators**, organised into **seven social sustainability categories** capturing the main social dimensions relevant to manufacturing, i.e., Employment Practices, Labor Standards & Workplace Conditions, Fair Compensation & Benefits, Ethical Practices, Health & Safety, Governance & Reporting and Impacts on Society.

To enable structured assessment, a composite **Social Sustainability Index (SSI)** was developed. The weighting of the seven indicator categories was obtained using the **Bayesian Best–Worst Method (BWM)** with input from 16 experts (out of which 9 were eventually used), yielding weights in the range **0.0677–0.1955**. The ranking of alternatives of a case study example application was subsequently performed with the **PROMETHEE II** method, generating a single SSI score for each option based on the weighted indicators and a normalized payoff table.

The shortlisted indicators and the Social Sustainability Index constitute the **social pillar** of the integrated circularity-environmental-social sustainability framework to be developed in WP4. They provide a scalable basis for evaluating the social performance of manufacturing systems within the broader CISAMS assessment methodology.