IRSA - CONGRESSO MUNDIAL DE SOCIOLOGIA RURAL (01/10/2025 A 20/01/2026) - IRSA 40 - CONCEPTUAL FRONTIERS OF THE RURAL: EPISTEMOLOGICAL INNOVATIONS AND EMERGING PARADIGMS IN THE CONTEMPORARY CONTEXT

TOWARDS A SOCIO-ENVIRONMENTALLY ADJUSTED HUMAN DEVELOPMENT INDEX (SEHDI)

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The Inclusive Bioeconomy Strategy (Project SECIHTI-CF-2023-G-1519) requires a socio-environmental baseline to facilitate the measurement of its long-term progress. The Human Development Index (HDI), created in 1990 by Mahbub ul Haq & A. Sen, and disseminated by the UNDP, emerged as an alternative to GDP per capita by including key social dimensions: health, education, and income. The HDI has been subject to methodological and conceptual criticism: its inability to capture the multidimensional complexity of human development, its omission of factors such as environmental sustainability and inequality, and its use of equal weightings across all dimensions. Recently, the planetary pressure-adjusted human development index was developed by

using the ecological footprint and per capita carbon dioxide emissions, but not the social dimension.

These limitations prompt the central question of the article: is it possible to construct a more robust index that incorporates the socio-environmental dimension and uses endogenous weightings that reflect real trade-offs between dimensions at the local level? To this end, a new index is proposed and applied to 52 rural municipalities in northern Puebla that explicitly integrates environmental impact and income inequality.

The procedure consists of five stages: formulation of the theoretical framework, selection of dimensions, normalization of variables, multivariate examination using Principal Component Analysis (PCA), and application of Data Envelopment Analysis (DEA), using Cross-Efficiency and Window Analysis techniques to obtain weightings, construct a synthetic index, and evaluate temporal evolution.

The results show that the first principal component accounts for a substantial proportion of the variance and is strongly correlated with the five dimensions. DEA reveals that weightings vary across municipalities and that performance trajectories differ between 2010–2015 and 2015–2020, including advances, setbacks, and stability. Overall, the new index provides a more comprehensive tool for designing public policies, promoting improvements grounded in best practices, and communicating results to citizens.

Palavras-chave: human-development-index; socio-environmentally; data-envelopment-analysis; principal-component-analysis; northern-puebla.