ASSESSING BEEF FARMING SUSTAINABILITY THROUGH A GLOBAL SUSTAINABILITY INDEX: A CASE STUDY IN THE ENVIRONMENTAL PROTECTED AREA OF "CEROULA" CREEK/MS, BRAZIL

Sub theme: Knowledge & Information

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Abstract:

Besides the efforts to promote sustainability in Brazilian beef farming, there is a lack of tools to help farmers assess and improve sustainability at farm-level. This exploratory study fills this void by proposing a global sustainability index (GSI) for beef farming that considers the managerial, economic, social and environmental (including production) dimensions, simultaneously. A range of 75 indicators, applicable to beef production, were drawn from FAO sustainability indicators list (SAFA), and prioritized by specialists from various fields, resulting in a list of 40 indicators spanning the four dimensions. To each indicator there was a corresponding question in the questionnaire applied to two beef farmers (A and B) in the Environmental Protected Area (EPA) of "Ceroula" Creek, Mato Grosso do Sul State, Brazil. Indicators within a dimension received the same weight, under the hypotheses of equal contributions to that particular dimension. The score of each dimension, expressed in a zero-to-five continuum, was given by: $\sum =1 \times 5$, where = weight for indicator i and = binary response (0 and 1 for absence or presence, respectively, of the sustainable practice) for indicator i. A weighting factor of 0.3 was applied to the economic and environmental dimensions whereas the social and managerial dimensions weighting factor was 0.2, because of the critical impact the first two have on short-term sustainability. In the estimation of GSI, the weighted dimension scores were added, resulting in a GSI ranging from zero to five, with zero indicating lack of sustainability, and five indicating the farming system was fully sustainable. With the aid of a radar chart, it was possible to visualize which dimensions were limiting sustainability. In this study, Farmer A had a GSI of 3.71 suggesting his beef enterprise was generally sustainable. In contrast, Farmer B obtained a GSI of only 1.31, indicating low sustainability of the production system. The radar chart showed Farmer A performed better (scores 4.0 and above) in the managerial and the social dimensions, than in the environmental dimension (2.9 score). For Farmer B, all dimensions scored low, particularly, the managerial and the economic (both with score 0.6), suggesting significant improvements are needed to achieve sustainable patterns. The fact Farmer A increased production, while Farmer B discontinued his beef enterprise was indicative of GSI consistency. The GSI was effective in capturing the sustainability of beef farming and synthesizing it in a sole index, of easy and straightforward interpretation. Complementary studies should validate the GSI, on a larger scale, and discuss variable weights for indicators and dimensions. Further applications of GSI could include regional studies to inform policy-makers to support beef farming sustainability. The adoption of GSI will support future farming systems to become more sustainable.

Keywords: sustainability assessment; sustainable farming systems; sustainable beef production