

Life Cycle Measures of Sustainability in Seafood Production: Implications for Ecolabeling, Certification and Consumer Education Programs

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To satisfy the criteria of strong sustainability, development initiatives must improve the quality of human life within the context of earth's carrying capacity. While this definition clearly establishes biophysical and ecological carrying capacity as the limiting factor for the scale of human activities, it is also imperative to recognize the paramountcy of social preferences and human needs in shaping development agendas. In other words, sustainable development must simultaneously address biophysical (material and energy flows with respect to carrying capacity), ecological (ecosystem structure and function, biodiversity), social (basic needs, security, equality) and economic (resource use and distribution) considerations. Ensuring the sustainability of seafood production requires efforts to reverse declines in global fisheries due to over-fishing, and to reduce the impacts to host ecosystems from fishing and intensive aquaculture technologies. In addition to proximate biological impacts, such efforts must necessarily also address the wider range of biophysical, ecological, and socio-economic burdens arising from the material and energetic inputs and emissions associated with these industries. While numerous ecolabeling, certification and consumer education programs are making significant headway in influencing consumer perceptions of the sustainability of alternative seafood products, the efficacy of these initiatives in promoting sustainability is severely compromised by the use of incomplete criteria. Life Cycle Assessment research of fisheries and aquaculture provides valuable insights into the environmental performance of alternative production scenarios, and should be used to inform a more holistic approach to labeling, certifying, and educating for sustainability in seafood production. This paper assesses the standards and criteria employed by several well-established sustainable seafood initiatives with reference to the major findings of both reported and on-going LCA research in fisheries and aquaculture.