Title: **Socio-Economic Analysis, Ecological Impacts and Sustainability of Long Line Mussel-Farming in the Gulf of Trieste**

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Abstract: Mussels aquaculture is a relevant activity for the fishery sector of the North Adriatic. Around 15 km of coastal water of the Gulf of Trieste, Italy, are used for the mussel long line farming, for a production of about 5000 tonn/year. The aim of this work is to assess sustainability of this activity in a Ecological-Socio-Economical (ESE) perspective by evaluating the role of mussels farming in the socio economic system and in the ecological system. A socio economic analysis has been conducted involving local stakeholders in meetings, and also by contacting them with bilateral interviews and questionnaires. Results of questionners, together with mussels production data declared at the Sanitary authority, and official economic data, have been used to quantify the economic relevance of the activity, and problems perceived by local farmers. For the ecological analysis, we monitored -on monthly basis- mussels growth and water quality parameters in 6 sites along the gulf. Feeding preference and faeces/pseudofaeces production, impact on surface sediment ad its reversibility have been investigated, too. Results have been used to calibrate a bioenergetic model representing the mussel physiology and growth in relation to environmental conditions, and the impact of mussel aquaculture on water column. The integration of the whole set of models and information will be used to give an evaluation of the ecological footprint of the activity and as a tool for coastal management.