Good Management Practices for Social and Economic Data Collection for Marine Renewable Energy

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Introduction

Marine renewable energy (MRE) is in the early stages of development globally, and uncertainty surrounds the potential social and economic benefits or effects that development may have on communities. Social and economic data and information related to MRE are needed to support permitting/consenting applications and are also critical to understanding social and economic dynamics and values in a community. Key economic data and indicators include effects on employment, wages, development of new companies, exports, and existing industries and key social indicators include effects on infrastructure, services, schools, hospitals, cost of living, and vulnerable populations. Examples of additional social and economic data are shown in Figure 1. There is a need to better understand these social and economic effects of MRE development – especially as these effects can differ widely between projects and over time – so that benefits from MRE are maximized and any adverse effects are avoided or minimized.

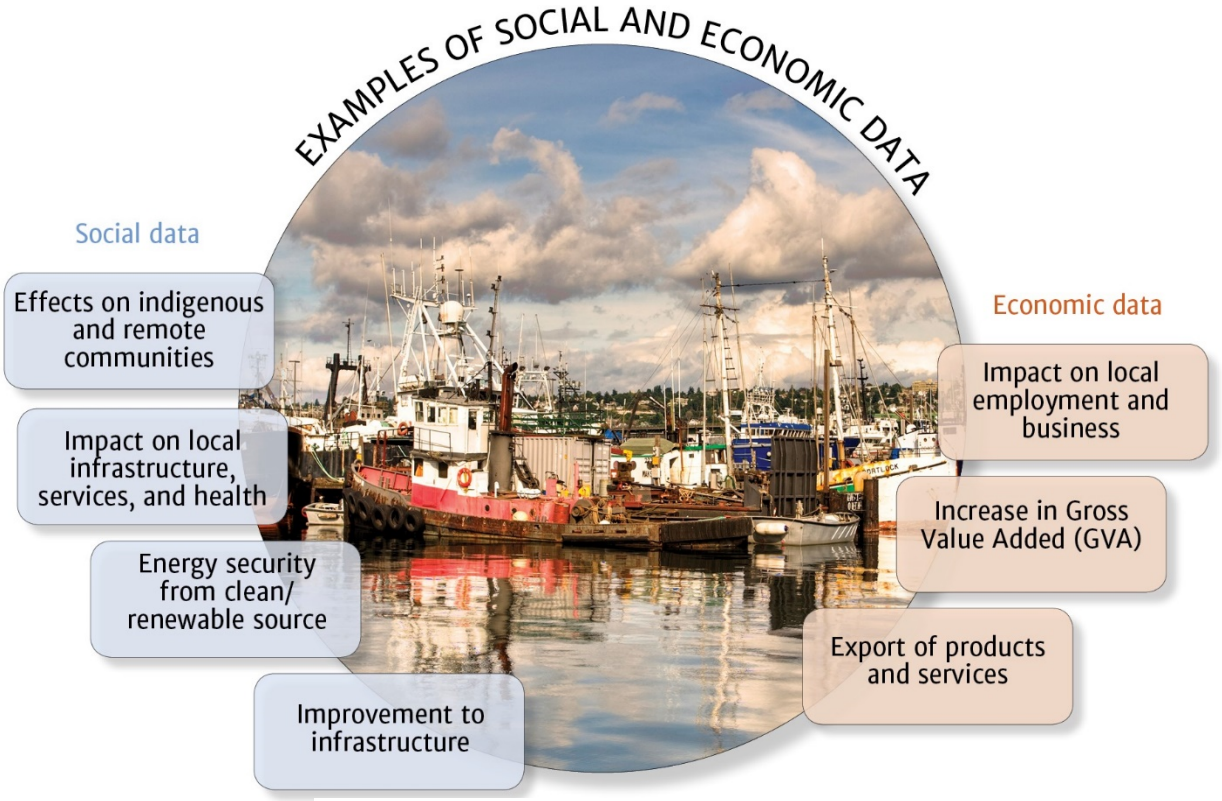

Figure 1. Examples of social and economic data.

Currently, there is lack of clarity on how both social and economic data are collected, analyzed, and presented that can slow permitting/consenting processes and, in some cases, hinder strategic planning and new development. Often assessments focus on the economic benefits or effects while the social benefits or effects do not receive a proportionate level of consideration by all parties. In addition, benefits and effects need to be assessed at different scales than those over which data are commonly collected by government. Most commonly, economic and social data are collected over a large geographic scale, such as nationally, regionally, or within large geopolitical areas within countries (or strategic level). However, economic and social benefits and effects from MRE are most likely to occur at smaller geographic, or local scales, such as within a community or municipality (or project level). Data collected at the strategic level provide a starting point with which to assess project level benefits and effects, but will need to be downscaled and augmented by locally-collected data.

Although social and economic data collection and assessment efforts are addressed jointly here, there are distinct methods, data types, and scales (both temporal and spatial) where the two differ. These differences are important to note when considering the broader social and economic impacts.

Purpose

OES-Environmental has developed Good Management Practices for the collection of social and economic data in order to provide greater standardization in baseline and development/operational data requested to support permitting/consenting MRE projects and to increase understanding of the social and economic benefits and effects of MRE developments. By increasing standardization and incorporating agreements among governments and developers, consistency in data collection can increase and allow for comparisons of data across projects, communities, and technologies. The Good Management Practices described in this report should be used to help reach these goals.

Best Management Practices

The term 'Best Management Practices', or BMPs, was coined in the US as a way to describe acceptable practices that could be implemented to protect water quality, as well as associated resources and habitats. The first published description of BMPs was released by the US Environmental Protection Agency (EPA) for developing guidance for National Pollutant Discharge Elimination System (NPDES) facilities to prevent the release of toxic and hazardous chemicals (EPA 1993). This guidance defined BMPs as practices or procedures that are qualitative and flexible. It further described BMPs as *general* (or baseline) practices and *specific* practices, with general/baseline practices widely applicable and practiced and easily implemented, while specific practices being applicable to a specific location or process and having practices that are often tailored to meet certain requirements.

The following Good Management Practices for Social and Economic Data Collection for MRE follow the same concept as BMPs. These Good Management Practices have been developed by the OES-Environmental initiative through several workshops that engaged MRE regulators, stakeholders, industry, and researchers (Annex IV and ORJIP, 2017; Annex IV and ORJIP 2018) and are meant to provide general guidance on efforts to collect social and economic data for MRE projects.

Good Management Practices for Social and Economic Data Collection for Marine Renewable Energy Projects

Data collection and assessment efforts need to be consistent to determine social and economic benefits and effects. Developing Good Management Practices and providing guidance for social and economic data collection for MRE projects can improve data collection, analysis, and lead to improved assessments of the benefits and effects of MRE projects, allowing communities and the MRE industry to be better served. When assessing social and economic benefits and effects, there are two levels of data collection and assessment that should be taken into consideration: strategic level and project level. Strategic level activities and measures should be implemented to meet objectives in line with local, national, and regional policy by government, agencies, and other relevant organizations. Project level activities and measures should be implemented on a local or project scale and led by the project developer. Baseline data collection (before development occurs) is needed to understand the current social and economic conditions in an area likely to be affected by multiple MRE developments (strategic level) and by a single development (project level). Once MRE projects are operational, compatible data are needed to assess whether there are unforeseen benefits or effects of the developments (strategic level) and to assess whether the predictions set forward by the developer in permitting/consenting applications are realized (project level).

The following practices align with these two levels of data collection and include who should be responsible for data collection efforts. They have been developed following a workshop in 2017 in conjunction with the EWTEC conference in Cork, Ireland, and an additional workshop in 2018 held in Kirkwall, UK.

Proposed Good Management Practices

Practice 1: Strategic level data collection, analysis, and assessments should be carried out by the appropriate level of local, regional, or national government (or relevant agencies) in order to understand benefits and effects of MRE projects.

Practice 2: Specific questions should be developed that elucidate changes in social or economic conditions (either benefits or effects) for the communities and regions in which MRE development is planned. These questions should drive the specific data collection efforts and analyses.

Practice 3: Baseline social and economic data should be collected that address the current social and economic attributes, at the appropriate scale, prior to MRE development.

> Practice 3a: Baseline data for strategic assessments should be gathered by appropriate level of local, regional, or national government, scaled to the closest possible geographic scale to the area of the MRE project, before development occurs.
>
> Practice 3b: Project level baseline data should be gathered by the project developer, assisted by existing supply chain companies and other local stakeholders as part of permitting/consenting processes, before development occurs. If multiple projects are occurring on similar timescales, the project developers should be encouraged to collaborate to help gather data to inform Practice 3a.

Practice 4: Social and economic data should be collected once MRE development has occurred and the devices are operational. To the greatest extent possible, data should be collected using similar variables/methods as baseline data to allow for direct before/after comparison.

Practice 4a: Social and economic data should be collected at the same scales, using the same methodologies for strategic level assessments, by the appropriate level of local, regional, or national government.

Practice 4b: Social and economic data should be collected at the same scales, using the same methodologies for project level assessment, by the project developer, with assistance from supply chain personnel and other local stakeholders, including local governments.

Practice 5: Results from both social and economic assessments should be clearly communicated to the communities affected by MRE developments, with a focus on transparency of methods, analyses, and purpose of the studies. Strategic level assessment communication is the responsibility of the appropriate level of government, while project level social and economic assessments should be jointly presented by the project developer and the appropriate level of government.

Social and Economic Data Collection

In addition to the Good Management Practices listed above, examples of recommended social and economic data and information were collected through the OES-Environmental and ORJIP expert workshops. While not exhaustive, these examples provide a helpful starting point for social and economic data collection. Examples of baseline data are listed in Table 1, and examples of post-installation/operational data are listed in Table 2.

Table 1. Social and economic data and information examples for baseline data collection (Annex IV and ORJIP, 2017; Annex IV and ORJIP 2018).

Baseline information required	Possible types and sources of data
Social	
Leisure and recreation (social)	• Core path designations • Marine recreation areas • Sailing routes • Recreational fisheries • Beaches, viewpoints, and land-based recreation areas
Protected areas	• Conservation areas (ecological, geological, cultural etc.)
Social/cultural context	• Cultural values and norms (including local languages) • Traditional activities (fishing, harvesting, local aquaculture etc.) • History of events • Social and economic drivers • Social structure/characterization (spatial/temporal factors) • Geographic extent (strategic level and project level) • Shipwrecks
Local population demographics and community structure	• From census data (including people with special needs) • Consideration of indigenous communities (sources of income, cultural norms etc.)

Success stories/existing information	• Positive case studies from MRE industry or analogous industries in same area • Lessons learned from other MRE or analogous industry developments • Social assessment/information
Economic	
Employment Statistics	• Level of employment/unemployment from local Censuses • Key industries and employers • Employment trends and projections
Gross wages	• From Annual Business Statistics
Gross Value Added (GVA)	• From national statistics databases
Exports	• Key local products and services • Export value from national statistics databases
Local services	• Education • Healthcare and social care
Ports and harbors	• Existing infrastructure • Current limitations and current development/upgrade plans • Proposed developments i.e. from National Infrastructure Plans
Transport links	• Rail, bus, and car transport from project location to major centres
Cables (e.g. grid) and communications (e.g. broadband)	• Transmission line capacity and any current development/upgrade plans
Commercial fisheries	• Landing data (key species, number of vessels, number of fishermen) including trends, value • Supply chain value (onshore processing etc.) • Fishing grounds for key target species • Spawning/nursery grounds for key target species • Aquaculture sites (existing and proposed), value
Shipping & Navigation	• Commercial vessels • Recreational vessels • Fishing vessels • Naval/defense vessels • Economic value to region • Trade routes?
Coastal tourism and recreation (economic)	• Number of visitors • Value to the local community • Key activities • Seasonal trends
Oil, gas, pipelines and gas storage	• Existing projects and infrastructure • Proposed developments • Areas zoned for future development • Economic value to region
Renewable energy developments	• Existing projects • Proposed developments • Areas zoned for future development • Economic value to region
Landscape and seascape	• National/local landscape designations • UNESCO sites

	• Coastal forts and built heritage

Table 2. Social and economic data and information examples for development/operational data collection (Annex IV and ORJIP, 2017; Annex IV and ORJIP 2018).

Effect / benefit	Information required regarding the development
Social	
Improvements to infrastructure	• Port, road and grid upgrades • Improvements to local communications
Increased knowledge of the industry	• Location of construction and O&M base(s)
Clustering effect	• Engagement with local suppliers/new businesses
Energy security	• Installed capacity and availability of power to the local community
GHG and pollutants avoided	• Overview of potential for reduction, carbon offset, etc.
Pressure on local infrastructure and services	• Infrastructure requirements • Workforce (during the entire project) and their requirements (housing/accommodation etc.)
Commercial fisheries displacement	• Location and realistic footprint of the development • Type of technology and support structures to be used • Cable route to shore • Vessel management plan
Effects on indigenous communities	• Offshore project footprint and activities • Onshore project footprint and activities • Local language (for outreach/engagement) • Health benefits and impacts
Effects on remote communities	• Location of the project • Power off-take method • Any changes in power demand and supply • Any displacement of traditional activities /cultural heritage /recreational activities • Local language (for outreach/engagement)
Economic	
Local employment and business opportunities	• Project power production capacity • Job creation potential range at each stage of the development • Inward investment potential at each stage of the development • Existing local and regional supply chain structure, e.g. number of companies operating in; o Technology development o Applied research, innovation and testing o Environmental consultancy o Engineering o Manufacturing and components o Vessels o Surveying

	o Deployment o Ports, port operations and land-based support o Service (hotels, restaurants and bars, travel/flights, etc.)
Increase in Gross Value Added (GVA)	• Project expenditure – CapEX and OpEX o Nationally o Regionally o Locally
Export of products and services	• Products created i.e. electricity, technology • Existing and new services • Potential value to the local/regional economy
Economic impact on local, remote, and indigenous communities	• Jobs • Services • Infrastructure • Access to economic activity

Conclusion

The formation of these Good Management Practices along with example of recommended baseline and operational data will be helpful to move the MRE industry understanding of social and economic impacts forward. With these practices guiding data collection, the MRE industry should have a better understanding of social and economic impacts at both strategic and project levels and be able to mitigate negative effects or expand positive impacts.

OES-Environmental will continue to work on and develop social and economic guidance for social and economic data collection for MRE. Most notably, OES-Environmental will include social and economic data collection as part of the 2020 State of the Science, which provides an update to the 2016 State of the Science (Copping et al. 2016).

References

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