

**From Blue Economy to Blue Communities: reorienting aquaculture expansion for
community wellbeing**

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Abstract:

Efforts to expand the marine aquaculture industry often draw on a discourse of opportunity that highlights untapped potential for economic growth. This discourse also underlies the more general concept of Blue Economy in which oceans are a frontier for economic development. Marine aquaculture is seen as an important part of Blue Economy, but the current discourse overlooks evidence that straightforward trickle-down effects—from aggregate economic growth at the national level to holistic benefits at the community level—rarely exist for marine aquaculture. Using the case of marine aquaculture in the United States, we argue that a shift in focus to community wellbeing is necessary to realize the potential benefits of marine aquaculture expansion. More generally, we suggest that marine aquaculture illustrates the need to reorient Blue Economy to Blue Communities, a concept that draws on the multidimensional concept of wellbeing to foreground social, cultural, and environmental factors alongside economic growth. With attention to just and equitable governance embedded in place and context, marine aquaculture can grow in ways that enhance wellbeing in Blue Communities while supporting broader economic development.

Key words: Blue Economy, Blue Communities, marine aquaculture, wellbeing, livelihoods, community development, justice, equity

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Aquaculture is the fastest-growing segment of global food production and marine aquaculture accounts for 38% of global aquaculture supply [1]. Projections of increased demand for seafood [2], and aquaculture's role in filling it, have many countries pursuing sectoral growth, including the United States (US). An Executive Order (EO) by the Trump administration, *Promoting American Seafood Competitiveness and Economic Growth* (May 7, 2020), describes aquaculture expansion as a way to reduce the national seafood trade deficit, increase seafood security, create jobs, and enhance rural prosperity. The language of the EO reflects a general discourse that frames marine aquaculture as an “immense opportunity” for economic development with few spatial or ecological constraints [3], and room for market expansion. The discourse of opportunity draws on current production statistics. For example: the US currently accounts for only ~0.5% of global aquaculture industry value [4]; the US imports 63 to 65% of its seafood [5], a figure more often cited as higher (e.g. 90% by the US National Oceanic and Atmospheric Administration [6]); domestic marine aquaculture accounts for less than 1% of seafood supply [7]. These types of figures explain why coastal states and the US federal government see the economic opportunity in marine aquaculture expansion. In the Trump EO, opportunity can be realized by streamlining permitting and reducing regulatory barriers to entry, in order to facilitate and promote capital investment.

Enthusiasm for marine aquaculture expansion reflects general interest in Blue Economy, a term that emerged from the 2012 UN Conference on Sustainable Development (Rio+20) [8]. Although originally defined variably among ocean stakeholders, Blue Economy increasingly emphasizes economic growth, framing oceans as “development spaces” [9] and a “commodity

frontier” [10]. Economic value is often expressed in aggregate form. For example, the Organization for Economic Cooperation and Development projects that, by 2030, the ocean economy will be twice as important to the global economy as it is today, contributing USD \$3 trillion in global value added [11]. In the US, the National Oceanic and Atmospheric Administration (NOAA) and Bureau of Economic Analysis calculated that the Blue Economy contributed \$373 billion to US GDP in 2018 [12]. However, ocean activities like marine aquaculture will be developed in particular places, and we are interested in Blue Economy generally and marine aquaculture specifically for the potential to support coastal communities. Using the US as an example, we argue that reframing marine aquaculture development as a community development activity undertaken to enhance wellbeing can open progressive possibilities. We consider wellbeing to involve material, relational, and subjective dimensions that are influenced by social, cultural, and environmental contexts [13, 14], in addition to economic ones. We also emphasize the centrality of equity and justice when considering wellbeing, including at scales beyond the individual [15]. We offer the term Blue Communities to capture these interests. Blue Communities are defined by how ocean-based production is guided by and translates into the wellbeing of coastal communities with place-based connections to ocean spaces and resources (Figure 1).

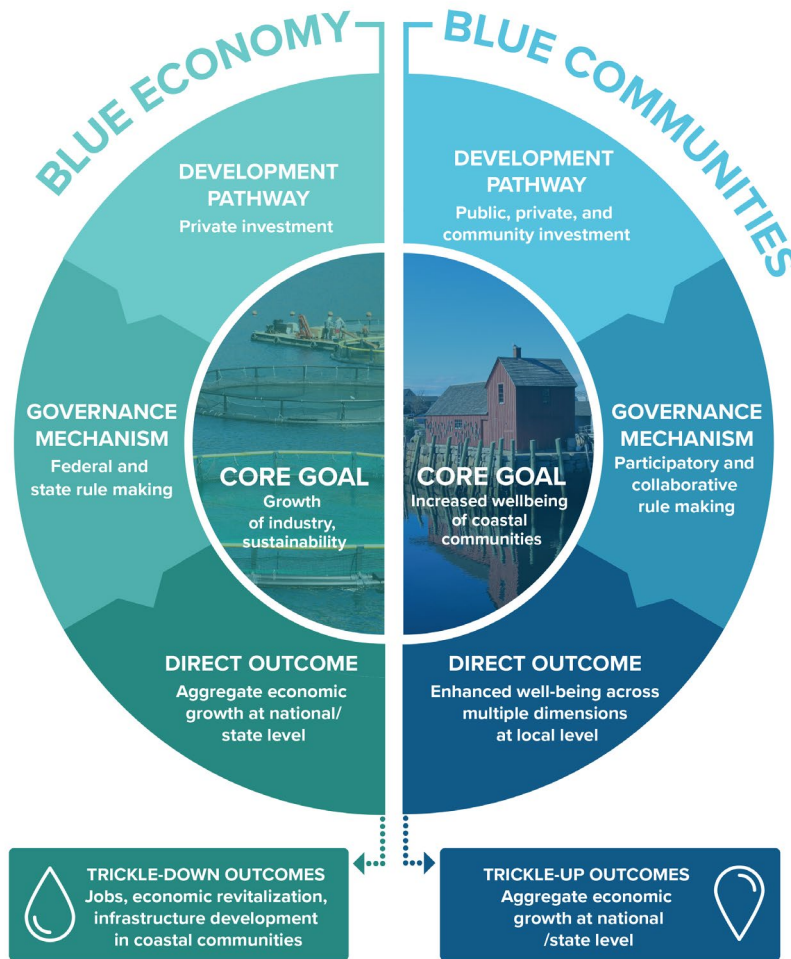


Figure 1: Contrasting Blue Economy and Blue Communities

In the US case, the Trump administration EO is just the latest initiative to encourage aquaculture expansion. Both state and federal agencies have increased public investments in marine aquaculture science and technology, engaged in efforts to streamline permitting processes and reduce regulatory burden, and elevated aquaculture policy objectives to encourage sectoral expansion [16]. Between 1995 and 2015, the federal government invested \$919 million (USD) in

aquaculture research and development [17]. Recently, a bi-partisan bill—Advancing the Quality and Understanding of American Aquaculture Act (S. 4723 in 2020; S. 3138 in 2018)—was proposed to reform and encourage investment in marine aquaculture, with support from industry and researchers. An example at the state level, North Carolina recently started a NOAA-partnered shellfish initiative, passed new legislation to enable shellfish aquaculture, and commissioned a statewide study that projects the potential to grow the farm-gate value of shellfish aquaculture from \$2.5 million to \$33 million by 2030 [18]. Similarly, in Maine, significant public investments in marine aquaculture have spurred parallel private investments and an uptick in new aquaculture operators over the past five years [19]; a statewide business group projects a threefold increase in aquaculture jobs (from 5,800 to 17,400) and near-fourfold increase in net aquaculture exports (from \$230 million to \$850 million) by 2025 [19]. Many states (e.g., VA, NC, and FL) have designated “Aquaculture Opportunity Areas” (alternatively called enterprise areas, enterprise zones, or use zones, among other names) to encourage sectoral growth, and these are encouraged in Trump’s EO. These are pre-permitted spaces reserved for aquaculture development that allow entrepreneurs and aquaculture businesses to forego lengthy permitting processes and begin operations rapidly.

In the discourse of opportunity, investment will result in marine aquaculture expansion and aggregate economic growth (Figure 1). This, in turn, will lead to improved livelihoods in coastal communities [20] (rural prosperity in the EO), through job creation, economic stimulus, infrastructure enhancement, and seafood security. Conflicts between aquaculture and pre-existing uses of marine resources are sometimes acknowledged, but these are often narrowly portrayed as primarily spatial, and marine spatial planning (MSP) is offered as a means to resolve them [21]. Even potential conflict with commercial fishing is recast as opportunity, as

fishermen in communities historically dependent on declining wild capture fisheries may find new employment in aquaculture, simultaneously providing the skilled labor required for a growing and diversified seafood sector [22]. However, the discourse of opportunity says little about the specific mechanisms by which aggregate economic growth will translate into locally meaningful economic benefits. It is mostly silent on related decision-making processes that might guide aquaculture expansion to deliver such benefits, particularly in ways that account for justice and equity in benefit quality and distribution. Although MSP is offered as a means to resolve conflict, how it will do so (and according to whom) is not addressed. Overall, “local socio-economic implications of aquaculture development are taking a back seat to trade, ecological and technical motivations” [23] (p. 45).

The lack of attention to place-based impacts and the specific governance processes that might enhance community wellbeing through marine aquaculture—what Krause et al. [23] label the “people-policy gap”—is problematic. In the US, past efforts to expand aquaculture that similarly emphasized economic opportunity, investment, and growth have typically led to mixed success across states and an uncertain policy landscape at the federal level [16]. More generally, research in the US and elsewhere calls into question the assumption that aggregate economic benefits will trickle-down to communities, and emphasizes the importance of the local economic, political, cultural, and social context in mediating whether impacts of aquaculture expansion are positive, negative, or mixed. Marine aquaculture development can fail to improve local incomes and food/nutritional security, prompt local conflicts, marginalize historical community interests, shift coastal livelihoods, displace commercial wild capture fisheries, and privatize ocean spaces for the benefit of non-local (and increasingly multinational) corporations [10, 20, 23-26]. Impacts, positive or negative, may be experienced differently within and among communities

according to gender, class and other demographic characteristics [20, 27]. For fishers specifically, interactions between fishing and aquaculture are mediated by things like fishing gear type, licensing, and levels of experience [10, 28], and it is unclear whether fishers will transfer into an expanding aquaculture sector. In Maine, transfer has occurred at very low levels so far [19]. Local resistance and conflict are often dismissed by marine aquaculture proponents as symptoms of not-in-my-backyard (NIMBY) attitudes, but they can be rooted in core place-based value systems and concerns for equity and justice, including in decision-making processes and sharing of benefits and burdens from industry growth [14, 24]. Even in cases where some local incomes have risen alongside aquaculture development, overall wellbeing may not keep pace, and community vulnerability can increase due to overreliance on the aquaculture sector [25, 29]. Although proponents of aquaculture increasingly recognize the need for “social license” to operate, the concept is often mobilized by industry to overcome local opposition to aquaculture [30], rather than to meaningfully engage communities.

Reframing aquaculture expansion to enhance community wellbeing

Enthusiasm for marine aquaculture expansion is currently high. We argue that prioritizing community wellbeing – and more generally Blue Communities – may help guide expansion in ways that avoid the shortfalls described above. A wellbeing frame recognizes that “what is important to people, communities and society” [31](p. 257) varies. Thus, central to Blue Communities is a governance approach that considers the multidimensionality and place specificity of wellbeing from the outset and embeds it in planning around a central question: aquaculture for whom and by whom? (Figure 1). At the level of state or federal government, this means being intentional about (re)developing institutional arrangements and goals based on local needs, wants, and capacities in the places and spaces where marine aquaculture is expected (or

planned) to grow in order to better ensure aquaculture develops equitably within those communities. This could involve rule changes that, for example, limit lease sizes, restrict consolidation, invest in shoreside infrastructure or community programs, or include residency requirements. During the siting and pre-permitting phases for aquaculture leases, efforts that focus on mapping economic and ecological potential for aquaculture expansion could also include assessments of community suitability and values, in order to improve the social fit of individual farms and cumulative industry development. Aquaculture Opportunity Areas could support creative approaches to aquaculture development, for example cooperative or community-based aquaculture enterprises. Co-locating small-scale producers in these areas can encourage and facilitate the cooperation that has been critical to small-scale producers in other locations [32, 33]. Some state and federal initiatives already recognize and invoke these types of community driven rule changes, often retroactively or as ‘add-ons’ to mitigate negative impacts or overcome community resistance. Blue Communities centers these types of activities and rules from the outset, as a means to enhance wellbeing.

Policy initiatives like these acknowledge the importance and *agency* of communities in the development of and participation in governance processes and outcomes appropriate for their interests and place-based human-environment systems. This is essential, as state and federal policy goals must ultimately be realized in particular places, with differential implications across coastal geographies, communities, and people [16]. As a result, socially beneficial outcomes from aquaculture are more likely to emerge when governance institutions work with local communities to take multidimensional wellbeing into account, and aquaculture is embedded within the human-environment systems in which it operates [20]. This does not need to be a barrier to productive aquaculture development; instead, differential translations of policy goals

can be opportunities to adapt governance and industry to local interests, capacities, and contexts. As federal and/or state agencies move forward in implementing, refining, and adding to the various policy initiatives described above, economic impacts should be thoroughly integrated with those on culture, society, and the environment. Broad economic goals like job creation or seafood trade will be important in Blue Communities, but they will be made meaningful in context, where concerns for agency, relationships, equity, ecosystem health, local food security, and subjective components of wellbeing interact.

Our arguments about marine aquaculture specifically and Blue Communities generally are premised on the assertion that discourse matters. Indeed, the concept of wellbeing demonstrates this; originally posed to counter the focus on economic growth as the measure of development, wellbeing is now broadly accepted, informing development goals, interventions and assessments [34]. We argue that, whether in the US or elsewhere, the way we frame opportunity in Blue Economy generally will shape specific policy design and implementation, closing or opening certain lines of discussion, limiting or enabling governance possibilities, ultimately with impacts on the wellbeing of coastal communities and environments [8, 35]. St. Martin [36] makes a similar argument about the role of ‘communities’ in US fisheries policy. Indeed, ecologists increasingly recognize the importance of such framing and are calling for a new narrative of the ocean to emphasize its importance in human-environment systems [37]. The discourse of opportunity—in Blue Economy generally and marine aquaculture specifically—currently privileges particular types of outcomes over others and marginalizes certain actors’ voices and concerns in decision-making fora. With the shelf life of the Trump EO now limited by a one term presidency, an alternative discourse is both desirable and possible. By reframing aquaculture governance around the wellbeing of Blue Communities rather than growth of the

Blue Economy, we shift our understanding of opportunity in aquaculture and promote a community focused answer to the central question: aquaculture by whom and for whom?

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