

Small-Scale Fisheries and the Global Fisheries Crisis: A Capabilities Approach

Poverty and Human Capabilities Capstone by Christopher Watt

On Africa's West Coast, hundreds of thousands of Senegalese fishermen go out to sea on *pirogues*, brightly painted fishing canoes, to catch sardinella and other pelagic fishes to provide food and income for their families; yet, more and more fishers are returning home with fewer fish than historical catches (Belhabib et al. 2014). In Kerala, India, fishers depart the beaches each day in various vessels to catch *Kutoombum-pularthi*, meaning "family provider," in the open ocean; however, the looming threats of climate change could disrupt the distributions of these fish up and down the coast, altering social and religious life for local fishing communities (McGoodwin 2001, 198). Worldwide, fishing constitutes wellbeing to communities who rely on marine and inland fishery resources, particularly in countries considered part of the developing world (Béné 2006). Not only do these communities depend on small-scale fishing for food security and income, but fishing as a livelihood shapes social identity, cultural belonging, and many communities' "way of life" (Garcia and Moreno 2001, Coulthard et al. 2011).

However, environmental degradation of these valuable fisheries' resources threatens the livelihoods of millions of small-scale fisherfolk worldwide. The Food and Agricultural Organization of the United Nations estimates that at least 70% of the world's fish stocks are fished at or beyond their sustainable levels (Garcia and Moreno 2001). Furthermore, climate change threatens to exacerbate the effects of overfishing, altering the geographic distribution of fish stocks and destroying vital habitats (Belhabib et al. 2016). Though many authors and development programs have recognized that environmental degradation of the world's fisheries threatens the major source of income and food security of fishing communities, little attention has been given to the harms it may have on other aspects of wellbeing, such as identity, self-

esteem, and ways of life, which fisherfolk receive from their occupations (Coulthard et al. 2011, Pollnac et al. 2001).

Considering the threat of environmental degradation to fisher livelihoods and wellbeing, this paper focuses on the following questions: 1) How should the wellbeing of small-scale fisherfolk, as derived from their livelihoods as fishers, be understood and promoted in response to the global fisheries crisis? This will be referred to as the “wellbeing question” throughout the paper. 2) What should be done if a tradeoff between different aspects of fisher wellbeing, such as different capabilities, is in fact necessary? This is referred to as the “tragic choice question.” In order to give due consideration to the many aspects of the overall wellbeing of fisherfolk, this paper argues for the use of a capabilities approach for understanding the threats of environmental degradation to the wellbeing of small-scale fishers and ensuring that fisherfolk have access to a good quality of life. In its final section, it offers a recommendation for co-management as a possible means of addressing the issues of environmental degradation in a way that upholds the autonomy and capabilities of those involved in small-scale fisheries, particularly as they may face situations of “Tragic Choice” (Nussbaum 2011).

Methodology

To answer the primary research questions, this paper reviews literature on small-scale fisheries and their contributions to the livelihoods of rural communities. It focuses on secondary literature, using both economic and anthropological research along with United Nations Food and Agriculture Organization (FAO) reports to explore the importance of fishing for income, food security, culture, and other aspects of the wellbeing of small-scale fishing communities with the hopes of answering the wellbeing question. Furthermore, it examines some of the scientific

literature on the global fisheries crisis related to overfishing and climate change to illustrate how environmental degradation harms the wellbeing of communities reliant on fishing for wellbeing.

Most importantly, it reviews the capabilities approach as developed by Amartya Sen and Martha Nussbaum, arguing that a capabilities approach should be used to understand wellbeing in small-scale fisheries and develop fisheries management, particularly to consider the possible existence of “tragic choice” that may face fishing communities. Lastly, it proposes a means of addressing the global fisheries crisis incorporates consideration for fishers’ capabilities and address the tragic choices that may result from the environmental degradation, namely a co-management approach.

Overview of Small-Scale Fisheries

Small-scale fishing, also known as artisanal or traditional fishing, is characterized by both marine and inland capture fisheries, which provide the basis of food security, income, and culture to millions of individuals and their communities on a micro level, as well as contribute to national and even international fish supply chains on a macro level (Béné 2006, Garcia and Moreno 2001). Though it is impossible to give a single definition which fully describes small-scale fishing amongst the millions of people who practice it around the globe, some generalizations are necessary to give a depiction of what is meant by “small-scale fishing,” with acknowledgement that it has no uniform state. As defined by the FAO, small-scale fisheries employ “labour intensive harvesting, processing and distribution technologies to exploit marine and inland water fishery resources,” often involving small watercraft, manual fishing methods and technologies, and a lack of electronic navigation devices (Béné 2006, 5). The FAO’s voluntary guidelines for small-scale fisheries frames small-scale fisheries as including “all

activities along the value chain—pre-harvest, harvest and post-harvest—undertaken by men and women” (Smith and Basurto 2019, FAO 2015). It is practiced widely in inland areas and coastlines of many countries in the developing world, such as the coastal nations of West Africa and Asian Pacific nations including the Philippines and Indonesia (Béné 2006, Pollnac et al. 2001).ⁱ

Though there is no single form in which small-scale fishing takes, characteristics of small-scale fisheries may be conveyed through a few case examples. Much of the literature neglects descriptions of the physical landscapes and features of the lives of fishing communities, but McGoodwin and others have described some of the aspects of life found in diverse sets of fishing communities through ethnographic research and time spent in the communities themselves (2001). In the fishing water around the Nigerian River Delta, men carry nets, fish baskets, and traps out to sea from the mouth of the delta in wooden canoes using outboard motors in pursuit of *bonga* and other pelagic species (McGoodwin 2001). Fishers from central towns move to semi-permanent settlements closer to the Delta as well as to seasonal camps on the beaches of the coast to live proximate to the fishery. Women handle, process, and sell fish, and are even involved in the fishing effort themselves, as well as act in shore gangs on the fish beaches, spending time removing fish from nets and organizing fishing equipment. All components of life in these areas, both for men and women, are centered around the fishing effort, including religious practices related to fisheries.

Fishing communities of the Kerala state of India have been traced back through poetry to the 1st-4th centuries AD, proving to be dynamic centers of culture for the region, yet characterized by diversity in the ways in which fishing is practiced after centuries of contact with foreign travelers (McGoodwin 2001). At least 14 different types of small fishing craft, along

with 23 gear technologies, are used up and down the coast to chase oil sardines, called *Kutoombum-pularthi*, or “family provider,” in the open water (McGoodwin 2001, 198). Life is centered around these fish and fishing related occupations in villages along the Kerala coast: fish sharing patterns are dictated by the communal nature of the fishing resource, shaping the ways community members relate to one another. When men bring catches back, the first portion goes to those who are unable to go to sea, such as widows or physically impaired fishermen. Women and girls receive the fish at landing sites on beaches and take the remainder home to cook. Whatever is left is sold, covering the costs of capital and labor. Kerala’s traditional resource use system ensures the livelihoods and food security of community members, upholds distributional justice, and promotes the stability of the fishery (McGoodwin 2001).

On the coast of West Africa, crews up to 15 men go out on large, colorful canoes to chase sardinella with large nets, as well as pelagic fishes with nets and hook and line (Belhabib 2014, Greenpeace). In Kafountine, Senegal, environmental NGO Greenpeace has documented the beaches bustling with masses of men and women welcoming the colorful *pirogues* and unloading their catches to be sorted and distributed for sale (Greenpeace 2012). Many women take the fish to be smoked. In Senegal, the fishing industry employs nearly 600,000 people providing 75% of the nation’s animal protein intake (Belhabib 2014).

Economic Value of Small-Scale Fisheries to Livelihoods

Despite diversity in the forms of small-scale fishing (including the size of these fisheries themselves), the literature recognizes that small-scale fisheries widely provide important sources of food security, livelihood, and other benefits. According to the SSF Guidelines of the FAO, artisanal fisheries “play an important role in food security and nutrition, poverty eradication,

equitable development and sustainable resource utilization” (FAO 2015). Poverty, as described by Béné, is prevalent among fishing communities, in terms of various dimensions of deprivation and a general lack of economic, political, and institutional development; fishing provides an opportunity for poverty reduction, or a situation “where people are becoming measurably better off over time due to their involvement/investment in economic activities” (Béné 2006, 11).

Though they take diverse forms in terms of the physical technology used, intensity of the fishing effort, and specifics of the cultural landscapes tied to them, small-scale fisheries share some cross-cultural uniformity, such as their importance as sources of livelihood (McGoodwin 2001).

One of the major values of small-scale fisheries, of focal importance in the literature, is their provision of food security to millions of people. Food security has been regarded as one of the main problems facing fishing communities by the FAO (FAO 2015). In Senegal an estimated 20,000 *pirogues* form a major fleet of artisanal fishermen who are largely responsible for providing over 75% of the animal protein intake of the Senegalese population (Belhabib et al. 2014).ⁱⁱ In a FAO report on the importance of fisheries for rural livelihoods, Béné asserts that fishing contributes both *directly* and *indirectly* to food security at the individual level (2006). *Directly*, fisheries provide subsistence, which may make a catch the difference “between food security and starvation” (Béné 2006). Comparative ethnographic research between two artisanal fishing sites in the Solomon Islands and industrial fleets in Australia revealed that 100% of artisanal fishers are motivated by food along with 93% motivated by income for fishing, relying directly on fishing for subsistence (Young et al. 2015). In coastal communities, such as in the Maldives, fish account for up to 96% of animal protein intake (Kent 1997). Through an assessment of data from the FAO, George Kent finds that populations in developing countries are often more dependent than those in developed nations on fish as their primary source of

protein (1997). On the other hand, fisheries provide *indirectly* to food security through income used to purchase food; Béné notes that many areas where small-scale fisheries take place are rural and often lack alternative livelihood opportunities (2006).

The literature widely recognizes the importance of small-scale fishing as a source of livelihood, or income. Béné and Friend along with others cite the Big Number Program from FAO and Worldfish center, which estimates that around 56 million people were directly involved in inland small-scale fisheries activities in 2009; another 50 million were involved in coastal or marine fisheries (2011; The BNP could not be publicly located). Kolding et al. estimate that 90% of the 120 million full or part time fishers world-wide are involved in the small-scale sector. They describe small-scale fisheries as a means of development, offering employment to poor populations and an estimated US\$61 billion a year in poverty prevention. Across the literature, consensus affirms that millions of people are in part or fully dependent on small-scale fisheries for their income, which is also tied to food security. In Senegal, approximately 600,000 people rely on fishing for income (Belhabib et al. 2014). Though more data is needed to assess the impact of fisheries on the material wellbeing of small-scale fisherfolk, it is widely acknowledged under currently available data that small-scale fisheries provide crucial sources of income as primary means of employment or parts of diversified livelihood strategies (Béné and Friend 2011), as well as offer important mechanisms of poverty alleviation fishing communities (Béné 2006, Allison and Horemans 2006).ⁱⁱⁱ

Environmental Degradation in Small-Scale Fisheries

However, environmental degradation, both anthropogenic and naturally caused, has dramatically harmed the ecosystem health of the world's fisheries and the livelihoods of those

who depend on them, leading to a global fisheries crisis. From a survey of the literature on small-scale fisheries, it is apparent that global climate change, on top of other forms of environmental degradation, has begun to alter the composition and ecological features of fisheries and will continue to threaten fisheries as historical sources of livelihood into the future through ocean acidification, changes in water temperatures, and the increased incidence of dramatic weather events. (Coulthard et al. 2011, Belhabib et al. 2016, and Badjeck et al. 2010). For example, the 1997/1998 El Niño contributed to changes in sea surface temperature, diminishing mackerel yields in Taiwan and Chile by 50% and 70%, respectively (Badjeck et al. 2010). In West African fisheries, sea surface temperatures have risen rapidly, changing 0.52, 0.46, and 0.24 degrees Celsius over periods from 1982 to 2006, affecting marine primary production, species distributions and assemblages, and ecosystem functioning (Belhabib et al. 2016). Barange et al.'s climate models predict that the Canary Current, where many West African fishers operate, will experience decreased production by around 14.6% (2014). Tropical regions, such as Western Africa and Southeast Asia, where nations like Senegal and Indonesia have the heaviest reliance on marine resources for economies and food systems, could experience up to 40% declines in fish stocks due to climate change (Barange et al. 2014).^{iv}

Though climate change poses a major environmental threat to the health of fisheries, overfishing has been identified throughout the literature as the primary threat to global fisheries. According to Garcia and Moreno's FAO report on marine fisheries, "Overfishing has been recognized, widely and formally, as a fact and as a problem calling for solutions" (2001). Rapidly increasing food needs due to population growth along with differing levels of economic development and an increasing economic burden falling on fisheries have caused overpressure in many fisheries (Pomeroy 2012). Pomeroy argues that overcapacity, or the idea that there are "too

many fishers chasing too few fish,” is leading to major declines in fish stocks (2012).^v In Southeast Asia, where fish provide from 20-50% of animal protein to an estimated 650 million people, fish stocks have been reduced to 5-30% of their unexploited levels, with current harvest rates at 30% more than sustainable yields (MSY) in some areas (Pomeroy 2012).^{vi} According to FAO data discussed by Garcia and Moreno, in most of FAO’s 16 statistical regions, at least 70% of the stocks are fully fished or overfished in relation to calculated MSY (2001). Garcia and Moreno illustrate that increases in the size of small-scale fishing fleets and improved technology across fishing sectors have led to declines in the resource base. Both the intrusion of illegal fishers into national Economic Exclusion Zones and the increased effort of local fishers have contributed largely to the decline of fish stocks as well (Pauly 2006, Belhabib et al. 2014). As production increases to meet the demand of the world’s growing population, as well as provide more fish for growing upper and middle classes, greater pressure is placed onto these fisheries and the resources are shifted away from the poor (Kent 1997).^{vii}

Furthermore, there are number of barriers to effective regulation of fisheries. Pomeroy offers a list of 15 elements that complicate reduction in fish harvests in this sector, including poverty, population growth, the open-access nature of fisheries resources, and subsistence fishing’s high discount rate (2017).^{viii} Because it has low barriers to entry and relies on primarily public spaces, it is an easy profession to enter, which could result in a tragedy of the commons type market failure. Kolding et al. note that between 1970 and 2005, the number of global fishers increased by 178%, increasing the strain on already exploited stocks. Additionally, the isolated nature of small-scale fisheries, and their dispersion throughout coastal and isolated areas, make effective monitoring very challenging (Kolding et al. 2014).

Old Perspective on Fisheries Degradation

Though the literature on small-scale fisheries largely recognizes the impact of the global fisheries crisis on the livelihoods and food security of small-scale fishing communities, little attention has been given to the harms of environmental degradation on other aspects of fisher wellbeing. Narrow perceptions of the harms of the crisis are largely attributable to older, narrow economic perspectives on fishing communities and fisheries management (Béné 2003). In their analysis on poverty in small-scale fisheries, Béné and Friend describe a narrow economic view of small-scale fisheries that combines the open access nature of fisheries with poverty prevalent in fishing communities, labeling fishing an “occupation of last resort” (2011). Along with Coulthard et al. 2001 and Kolding et al. 2014, they oppose this perspective of fishing as merely a means of employment for the “poorest of the poor,” which is promoted throughout earlier academic literature on small-scale fisheries.

For example, Panayotou argues that due to the isolation of many coastal fisheries coupled with the socio-cultural features of fisherfolk, particularly related to poverty, the open access nature of fishing contributes directly to the impoverishment of fisherfolk (1982). He attributes this poverty largely to the lack of “sufficiently attractive alternatives to warrant the cost of change in occupation” along with the challenge of moving to new social environments (Panayotou 1982, 3.3). Béné points out two primary views which he describes as “pillars of the old paradigm,” namely that fishers are poor because they are fishermen, and second, that people fish because they are poor (2003, 955). Both perspectives equate fishing with poverty, which, when considered alongside the idea of the “tragedy of the commons,” leads to the perception of a poverty trap within fishing populations (Coulthard et al. 2011, Béné 2003). These perceptions, as

described by Béné, regard fisheries as little more than “safety valves” against other negative shocks for those who are isolated with few other means of income or livelihood (Béné 2003, 955).^{ix, x} The two-way link of fish depletion leading to poverty alongside poverty contributing to fish depletion ought, however, be reconsidered due to a lack of supporting evidence and failure to consider the multifaceted lives of fishers, along with recognizing that the depletion of the world's fisheries is largely attributable to exploitation by industrial fleets (Béné 2006).

Small-scale Fisheries' Value Beyond Financial Wellbeing: Human Capabilities

In order to address the impacts of the global fisheries crisis and promote the wellbeing of small-scale fishers through developmental policy and fisheries management, approaches to fisher livelihoods must consider the non-financial benefits of fishing. If the wellbeing of fisherfolk derived from their profession consists of more than simply their ability to garner income and survive, then these dimensions of their lives should be relevant in considering the harms of the global fisheries crisis and determining management practices. Taking a capabilities approach to poverty and the quality of human life offers a valuable perspective on the wellbeing of individuals in small-scale fisheries. In contrast to a number of narrow economic focused perspectives on the livelihoods of fishers, Amartya Sen and Martha Nussbaum's capabilities approaches contribute a broader understanding to the quality of life and wellbeing of an individual (Sen 1999). This approach includes that which is a “necessity in society” and required to take “part in the life of the community,” which simply focusing on material wellbeing or income may not consider (Sen 1999, 73). Sen's approach has two primary features: so-called functionings and capabilities. Functionings encompass the features of life or “things a person may value doing or being,” ranging from food security to an individual's “complex activities or personal states, such as being able to take part in the life of the community and having self-

respect” (Sen 1999, 75). For example, in the context of a fishing community, this would include remaining food secure by fishing, or experiencing ties to the social fabric of a community by participating in traditional religion and rituals tied to fishing in many villages along the Nigerian Delta (McGoodwin 2001).

These functionings, in various or alternative combinations, make up a person’s capabilities. Sen refers to capabilities as types of “freedom[s]: the substantive freedom to achieve functioning combinations” (1999, 75). Sen describes freedom as the “opportunity to achieve our objectives,” or the capability to achieve that which “we can and do value” (Sen 1993, 522). Second, freedom involves the “process of autonomous choice,” involving the real opportunities to make choices about the capabilities individuals desire to achieve (Sen 1993, 522). Hence, in the context of fisheries, capabilities may include the ability to participate in fishing as a means of food security or part of a diversified livelihood strategy, or even the ability to enjoy fishing as a historically relevant “way of life” tied to sacred rituals as in aboriginal villages of Australia (Béné and Friend 2011, Halim 2018). A capabilities approach, therefore, places importance on the material aspects of an individual’s life alongside the freedom of individuals to “lead the lives they have reason to value or to enhance the real choice they have” (Sen 1999, 293). That which may impede one’s ability to access functionings and necessities for survival, as well as infringes on their freedom to make choices about the course of their lives diminishes their capabilities.

Small-scale fishing has a much greater impact on fishing communities than narrow economic benefits. As McGoodwin describes from his research, “fishing occupations [are] interwoven through the whole fabric of a community’s local culture... Social organization...economic organization, political organization, religious organization, [and] cultural self-identity” (2001, 15). The FAO articulates that these fisheries are “strongly anchored

in local communities, reflecting often historic links to adjacent fishery resources, traditions and values, and supporting social cohesion” (2015). Coulthard et al. reveal that similar to many professions, fishers experience a high degree of self-esteem as “there is usually a profound pride in their occupational identity as fishers and a correspondingly high devotion to the fishing way of life” (McGoodwin 2001, 2.5, qtd. In Coulthard et al. 2011). In his review of human dimensions of Asian Pacific Fisheries, Kittinger describes the motivation for fishing beyond profit seeking and subsistence, including recreational value and important cultural purposes (2013). For example, aboriginal fishing communities in Australia attribute sacredness to their fishing grounds, practicing rituals such as providing fruits to the sea to keep them safe and protect their fishing business (Halim 2018).^{xi} Furthermore, Young et al. find cultural and recreational benefits of artisanal fleets: 61% of Solomon Island fishers identified social aspects of fishing as important reasons for participating, along with enjoyment (2015).

Contradicting the “occupation of last resort” perspective, Pollnac et al. argue that fishing provides much more than income, having surveyed fishing households from villages in the Philippines, Vietnam, and Maluku Islands of Indonesia (2001). When asked about their occupations and alternative means of income, fishers across the sample indicated that they would not change to alternative occupations. In the Philippines and Maluku, 9 in 10 fishers said they would have the same occupation if they were to relive their lives. Many offer “tradition” as their primary reason for remaining a fisher in another life, particularly in the Philippines.^{xii} Pollnac and Poggie have also studied the relationship between fishing and wellbeing, asserting that there is much more to fishing than income and employment (2008). They question why fishermen are so attached to their occupation and create a heuristic model illustrating fishermen’s happiness with their profession, which attributes fishermen’s refusal to choose alternative livelihoods to

personality characteristics consisting of individual, cultural, and genetic factors including preferences for risk, adventure, and other non-monetary benefits of fishing.^{xiii}

Furthermore, a number of authors have uncovered mechanisms in the relation between poverty and fisheries, attributing them to factors other than occupation. Through case studies of the Lake Volta region in West Africa and Mekong River Basin in Southeast Asia, Béné and Friend illustrate a variety of mechanisms through which fishing acts as a part of diversified livelihood strategies in fishing communities (2011). Refuting the older perspective, they argue that poverty in these communities goes beyond income, relating to numerous socio-institutional factors such as political marginalization and isolation, lack of governance, and poor access to health and education services. Poverty in fishing communities is not a result of fishing occupations, but rather attributable to vulnerability and marginalization as interrelated aspects of fishing communities' general deprivation (Béné and Friend 2011). Similarly, Ratner et al. 2014 highlight human rights violations in fisheries using human rights case law review. Violations such as gender-based violence and child labor are not unique to the fisheries sector, but Ratner et al. find disproportionately high and underappreciated rates for many of these issues, meriting greater monitoring and response (2014). Though not directly explored in this paper, these harms to wellbeing deserve greater attention in the literature on fisheries and poverty going forward.

Why the Capabilities Approach?

Though there are a number of other frameworks that could be used to shed light on the fisheries crisis, the capabilities approach is useful in moving past previous development approaches that focused solely on economic well-being and economic development, and further places importance on the autonomy of individuals over their lives. A capabilities approach acknowledges the importance of not only the financial and physical dimensions of human

wellbeing, such as food security, income, and other necessities, but also other values and opportunities needed to achieve a good quality of life. To better illustrate the many dimensions of wellbeing that matter in a capabilities approach, Martha Nussbaum's list of "central capabilities" provides a clearer understanding. In her approach, she creates a list of ten different capabilities that, combined, create a threshold amount required for a "life worthy of human dignity" (Nussbaum, 2011, 32). She calls these ten the "Central Capabilities."^{xiv} This list offers a basis for good quality of life that would plausibly be desired by any individual and therefore ought to be regarded as such for fishers. If fishers do indeed receive benefits from their occupation beyond income and basic survival, the narrow values perceived by the view of fishing as an "occupation of last resort," then using a capabilities approach in understanding the wellbeing of small-scale fishers and developing fisheries management could serve to best promote the overall wellbeing of individual fisherfolk and broader fishing communities.

In more specifically considering the capabilities of small-scale fishers, it is possible to illustrate some examples of Nussbaum's capabilities' presence in the lives of small-scale fishers. Most basically, fisheries are valued by the over 100 million people involved in them as vital sources of livelihood and nutrition, giving them the opportunity to achieve the capability of "life" (Kolding et al. 2014). For the Senegalese people, who derive 75% of their animal protein from fish, the ability to fish is certainly important in achieving "bodily health" (Belhabib et al. 2014). Fishing's importance for self-esteem and self-identity, as noted by many fishers, makes it an important source of "affiliation" while fisheries resources' sacredness or importance as aspects of local religions, such as in some Nigerian and Aboriginal fishing communities, makes them valuable for "senses, imagination, and thought" of fishing residents in those communities. Though it does not explicitly fall under Nussbaum's categorization of "affiliation," it seems

appropriate to consider involvement in the social fabric of the community a core aspect of this capability because many communities are organized around the occupation of fishing, as depicted by the fish sharing system of Keralan villages.^{xv} Particularly notable here is the capability to live in relation to “other species.” Beyond the occupation’s simple dependence on relating to or engaging with other species for success, in the Solomon Islands, over 60% of Young et al.’s respondents found motivation for fishing in “environment, nature and scenery” (2015, 117).^{xvi} It is clear that a capabilities approach is largely applicable to the lives of small-scale fishers as it acknowledges major aspects of wellbeing including food security and income alongside the whole array of values garnered from fishing as an occupation and centerpiece of society for fishing communities.

Other Wellbeing Approaches to Fisheries

Other authors have sought to consider these diverse values of fishers and aspects of their wellbeing beyond narrow, economic livelihood. As described by Coulthard’s application of a social wellbeing framework, which defines wellbeing as “a state of being with others, which arises where human needs are met, where one can act meaningfully to pursue one’s goals, and where one can enjoy a satisfactory quality of life,” individuals have basic social and psychological needs that must be met in order to experience overall wellbeing. The social wellbeing approach breaks down wellbeing into both “objective wellbeing,” consisting of basic, material needs, and “subjective wellbeing”, which concerns the achievement of freedoms and quality of life, considering fishing as a “way of life” (Coulthard et al. 2011). Much like a capabilities approach, this approach affirms that failure to meet not only basic needs, but also provide valued freedoms and support quality of life through fisheries policy undermines overall community and individual wellbeing. Similarly, Weeratunge et al. have proposed nine ways in

which a wellbeing lens can view small-scale fisheries, arguing that “a wellbeing lens recognizes people’s expressed aspirations and goals, focusing on what people have and treasure, and what they feel they can do, rather than what they cannot” (2014, 270).^{xvii} Through a social wellbeing approach, it is possible to conceptualize how “material aspects can be combined with emotional needs, cultural dimensions, formal and informal social relations, self-defined rights and freedoms and how people come to understand wider political, social, and economic structures which govern them,” for creating fisheries policy (Weeratunge et al. 2014, 270). These approaches affirm the need to look beyond the “objective” to also consider the “subjective” and “relational aspects of wellbeing, which are incorporated in the capabilities approach.

Allison and Horemans promote a Sustainable Livelihoods Approach to marine policy and fisheries development (2006). This framework considers: (1) the livelihood assets held by fisher-families, including their forms of human, natural, financial, physical, and social capital; (2) the policies, institutions, and processes (PIP’s), such as market liberalization, that affect their livelihoods; and (3) the vulnerability context in which fisherfolk live. The hope is to develop policies in the context of this model that allow people to sustain their livelihood in the face of various vulnerabilities in order to improve levels of living and wellbeing, mitigate the vulnerability of fisheries communities to external shocks, and promote the natural resource on which they rely. However, the SLA is limited in its inability to conceptualize human agency and values as well as the way that institutional practices shape people’s livelihoods, along with diversity in “local institutional practices and relationships” (2006, 764).

Each of the above approaches to understanding the lives and values of small-scale fishers offer valuable insights into the many aspects of fisher wellbeing. Importantly, they affirm the importance of fisheries beyond means of narrow economic wellbeing and support policy that

considers the diverse aspects of the lives of fishers. However, the capabilities approach is able to consider the multiple aspects of wellbeing highlighted by these approaches while also giving greater clarity on what opportunities and abilities are necessary for a good quality of life, promote the autonomy of fishers in achieving those capabilities, and, lastly, consider the possibility of conflict between multiple capabilities, or a situation of “tragic choice.”

Tragic Choice in Small-Scale Fisheries

In answering the broader question of environmental degradation’s effect on the livelihoods of individuals dependent on small-scale fisheries, as well as considering how the wellbeing of small-sale fisherfolk should be prioritized in response to the fisheries crisis, it is necessary to consider a possible point of tradeoff—a case of “Tragic Choice” (Nussbaum 2011, 36). As Martha Nussbaum describes in her book, *Creating Capabilities*, individuals may come to situations in which they are forced to make decisions between two Central Capabilities (Nussbaum 2011). Under certain circumstances, it is possible that achieving one capability may compromise another. These cases are “tragic” because achieving one capability comes at the expense of sacrificing another—a necessary aspect of achieving a good quality of life. In Nussbaum’s words, “any course we select involves doing wrong to someone” (2011, 37). For example, it is plausible that in achieving the Central Capability of “affiliation” by practicing his or her preferred religion, a person may be persecuted, even to the point of death, forcing them to sacrifice their capability of “bodily health” or even “life.” Nussbaum describes the cost of this choice—of being compelled to give up one or more of the central capabilities—as one that no individual should have to bear.

Considering the fisheries crisis through the lens of human capabilities, the loss of fish stocks due to environmental degradation may be seen as an infringement on the capabilities of

small-scale fisherfolk, particularly as certain management regimes, such as rights-based approaches, could threaten fishers' ability to engage in their occupation (Kolding et al. 2014). Economic theory may suggest that in order to monitor access to a public good and reduce overconsumption, putting quotas on the number of boats allowed to fish a zone or offering alternative livelihoods would eliminate excess pressure on the fishery. Policies under a "wealth-based approach" limit access through individually transferable quotas, which grant property rights to industrial fishers to reduce fishing pressure, maximize economic rents, and increase profits for those who remain (Kolding et al. 2014). In theory, benefits should be redistributed throughout society, but this excludes potentially millions of people from the fishing sector, failing to consider the capabilities fishers derive from being able to participate in this livelihood.

Though intended to reduce the degradation of fisheries and improve the livelihoods of fishers, these policies potentially impose major "unfreedoms" on those who rely on artisanal fisheries for their livelihoods and create points of tragic choice (Sen 1999). Concerns about the fisheries crisis' harm on livelihood and food security are of vital importance, but it is also necessary to protect the many other capabilities of fishers beyond "life" and "bodily health," incorporating Nussbaum's entire list (Nussbaum 2011). The threat of a tragic choice particularly arises when the method taken to address overfishing privatizes fisheries resources or pushes fishers toward alternative sources of income. Though it is possible that other livelihood strategies may appeal to fishers in certain localities, providing greater income and desirable work, for communities like the those on the Nigerian River Delta, who associate their practices of fishing with local religion and rituals, taking up alternate livelihoods could sacrifice these relevant cultural and religious aspects of wellbeing (McGoodwin 2001). The loss of access to fish stocks

may create a barrier to fisherfolk's ability to partake in community life and garner self-esteem and identity from their occupations, diminishing critical aspects of their functionings.^{xviii}

Considering the long-term health of a fishery and fisherfolk's ability to enjoy the satisfaction, community and cultural benefits derived from fishing, it is necessary that the physical resource be sustained; yet, as fish are depleted due to the incursion of industrial fleets into artisanal waters, illegal fishing, climate change, and/or poor government management, the continued pressure on a fishery by the small-scale sector could drive a fishery to extinction. Here, it seems that maintaining economic wellbeing will either exploit the fishery, harming their ability to achieve capabilities into the future, or require a search for other occupations and income. This could come at the sacrifice "affiliation" to "self-identity and individual pride...shared cultural identity, [and] sense of common social norms" (Nussbaum 2011, Béné 2006, 35). In places where fisheries have declined, substitution away from fishing as a source of livelihood in order to maintain "bodily health" through income and food security comes at the cost of the other capabilities. It is clear that the global fisheries crisis poses a major threat to the capabilities of fishers, particularly in causing cases of tragic choice.

However, there may be opportunity to overcome this tragic choice and the unfreedom posed by environmental degradation. Nussbaum reveals that through various interventions or policies, it is possible to circumvent this problem to construct opportunities in which both capabilities can be realized. More so, Nussbaum highlights that effective policy for maintaining each of the capabilities "respects an individual's practical reason...alluding to the centrality of choice in the whole notion of capability as freedom" (2011, 39). There is no concrete form in which the capabilities should take for every society; rather, they are malleable to the "different traditions and histories" of where they are considered and maintained through policy, making

them perfectly conformable to the considerations of diverse fisheries histories and cultures (Nussbaum 2011, 40). It is vital, however, that they are promoted and protected to enable small-scale fishers to experience good quality of life, both now and into the future.

Conclusion: Fisheries Co-Management and Promoting Capabilities

In addressing the global fisheries crisis, management of fisheries should consider the importance of all capabilities of small-scale fisherfolk, promoting income and food security along with the other necessary aspects of good quality of life by placing autonomy over fisheries governance in the hands of fishers themselves. Co-management strategies may offer a mechanism for upholding the capabilities of small-scale fisherfolk by combatting environmental degradation through sharing “responsibility and authority between the state and resource-users” often soliciting the collaboration of other stakeholders as well, including NGO’s (Evans et al. 2011). This practice relies on local knowledge and community action to sustain ecosystem health and ensure the maintenance of fisheries as sources of economic livelihood, while, as Ratner et al. reveal, harnessing the power state agencies and law enforcement to monitor fisheries and enforce policies against overfishing and illegal fishing (2012). Co-management solutions are currently implemented in at least 221 fisheries in over 50 developing nations, and function as the most common form of fisheries management in Asia (Evans et al. 2011, Ratner et al. 2012).

Thus far, co-management programs seem to offer an effective system for promoting the wellbeing and autonomy of fishing communities. Though it is difficult to fully assess the effect of these programs due to a lack of impact-assessment data, Evans et al. find that for key outcome indicators, including household income, household well-being, resource well-being, fishery yield, and resource access, co-management induces trends toward proportionally more positive

results over time (2011, Ratner et al. 2012). From their review of Philippine community-based projects, Pomeroy et al. find that these programs spread responsibility to and throughout local communities, which can “enhance social equity... [and] the perception of empowerment” as well as “improve the resource, their life and livelihood, and their community” (1996, 11). Young et al. also promote co-management solutions as they “integrate extremely diverse natural, socioeconomic, and cultural systems and harness strong local organizations to build from the bottom up and create a sense of ownership among fishers and the community” (2015, 121).

Unlike top-down management strategies which may fail to consider needs, motivations, and rights of local fishing communities, and solely focus on resource development and the economic wellbeing of fishers, co-management integrates “personal, social, and cultural motivations to fish” into local fisheries governance (Young et al. 2015, 121). Conferring greater control into the hands of local fisherfolk who have local knowledge of their community and ecological needs empowers them to protect their fisheries resources, sources of income and capabilities like “bodily health,” as well as retain their historically and culturally relevant “affiliations” and sources of “senses, imagination, and thought” as the primary managers of their resources. This capability building approach to fisheries management keeps fisheries resources under the autonomy of community members themselves and allows them to enjoy the various capabilities related to their occupation rather than having to sacrifice certain capabilities to maintain economic wellbeing.

In order to ensure that fisherfolk have access to attaining what Nussbaum terms the central capabilities, fisheries management and policy must look beyond the material side of wellbeing and regard the subjective benefits of fishing as necessary considerations in fisheries

management. Co-management offers viable policy strategy, which has already been implemented broadly in Pacific fisheries, both for its conferral of autonomy into the hands of local fishing communities and adaptability to local needs, alongside its use of state power to monitor and enforce fisheries regulations in order to protect the wellbeing of resource poor populations. What is most salient in viewing fisheries through a capabilities approach is recognizing that fisherfolk derive value and wellbeing beyond income from their occupations; though much needed food security and income must be protected by fisheries governance, these must not be viewed as separable from the other capabilities of fishers. Through co-management, it is possible to address the global fisheries crisis without facing situations of tragic choice, promoting all components necessary for a good quality of life.

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ⁱ Importantly, there is no single form in which small-scale fishing takes. In fact, much of the debate in the literature on small-scale fisheries has grappled with defining small-scale fisheries particularly as differentiated from large-scale or industrial fishing. In a literature review analyzing the definition of small-scale fisheries offered throughout papers on the subject, Smith and Basurto consider small-scale fisheries to encompass “wide-ranging activities undertaken throughout the value chain by both men and women in inland and marine fisheries, including harvesting from boats and on foot, along with pre- and post-harvest labor that occurs on land,” but assert that inconsistency throughout the literature as well as heterogeneity across the world must be considered when making generalizations about small-scale fisheries (2019). They assert that small-scale fisheries and the people that inhabit them are often narrowed based on their technological features, isolating fishers from the web or relations that are embedded in their “bio-physical environments, management regulations, forms of organization, kinship ties, social

norms, and exchange relations” (Smith and Basurto 2019). Furthermore, Kolding et al. argue that a serious problem for evaluating and managing small-scale fisheries, particularly in comparison to industrial fisheries, is a lack of sufficient data and information (2014).

ⁱⁱ The estimate of percentage of protein provided by fishers also includes the output of the 100 industrial boats in Belhabib et al. 2014; however, they note in a later part of the paper that Artisanal catches represent 74% of the catch caught and landed in Senegal.

ⁱⁱⁱ Of note, some authors caution that the literature lacks quantitative data on fisheries’ actual economic impact, claiming that the impact of fisheries loss on the livelihoods of fishers is, at this point, largely understood theoretically (Kolding et al. 2014).

^{iv} Changes in distribution, however, do not necessarily harm all fisheries, as general circulation models conducted by Barange et al predict some fisheries to improve, with 30-70% estimated increases in catch potential in certain areas, particularly in latitudes farthest from the equator, by 2050 (Belhabib et al. 2016, Barange et al 2014)

^v Overcapacity as defined by Pomeroy (2012) occurs when the “fishing capacity is greater than some optimal or desired level (in terms of catch and corresponding fleet size).”

^{vi} Put simply, the Maximum Sustainable Yield is the maximum amount of fish that can be harvested from a fishery in order for the fishery to continue to reproduce at the same rate

^{vii} This places further concern on the food security needs of fishing communities in the face of the global fisheries crisis as noted by Belhabib et al., who are concerned that changes in the distribution of fishes can increase disparity in food security between developing and developed nations (2016).

^{viii} Discount rate is an economics term referring to the preference of resource use in the present rather than continual consumption into the future.

^{ix} Though it is beyond the scope of this paper, another argument contradicting the claim that fishing is an “occupation of last resort” highlights that in many developing countries, fishers have greater incomes than workers in other industries. Pollnac et al. point out a lack of quantitative evidence for the “poorest of the poor” claim, noting a number of studies, including a survey from 1979 in various regions of the Philippines reporting that annual incomes of fishing household were higher than those of certain agricultural workers such as rice farming households (2001). Another survey from Vietnam found that annual average income of fishing households is higher than non-fishing households in all surveyed districts (Pollnac et al. 532). Pollnac et al cite a number of other studies reflecting the same findings.

^x Though it is not vital to understand this perception of fisheries in the larger argument of their importance as sources of wellbeing, it is helpful to understand where the literature has come from and where it is going. Coulthard et al. note that the assumptions that “fishers are uniformly poor and that their occupation is low status are not widely borne out” (2011, 455).

^{xi} As noted earlier, there is much diversity amongst the specific aspects of individual small-scale fishing communities. Hence, the social status attributed to fishers, its importance as a social norm, and the aspirations and values of individuals within fishing communities are heterogenous (Coulthard et al. 2011,

Pollnac et al. 2001). For example, Pollnac et al. found variability in the responses of Pilipino fishers to questions about whether they would change their occupations. In some communities, the number who said they would change if offered alternative livelihoods was slightly larger or equal to the number that would remain in the fishing sector. Many fishers with higher levels of education conveyed that they would choose to exit if offered alternatives, as well as those who garnered less of their incomes from fishing.

^{xii} Pollnac et al. argue that their study and sampling pool are representative of small-scale fisheries around the world, combatting the assumption that fisherfolk would choose alternative livelihoods if they were available. Fishers' responses to surveys indicated that "fishers tenaciously adhere to their occupation even as catches and incomes fall" (2001, 533).

^{xiii} Though their focus on industrial fisherman in the New England may not be fully representative of small-scale fishers, particularly as fisherfolk in New England may have greater access to alternative means of income, their study can contribute to understanding some of the attributes that cause fisherfolk to prefer their occupations. Namely, that it makes them happy, and this is in itself of great value.

^{xiv} The ten central capabilities include 1) life, 2) Bodily Health, 3) Bodily Integrity, 4) Senses, thought, imagination, 5) Emotions, 6) Practical reason, 7) Affiliation, 8) Other species, 9) Play, and 10) Control over one's environment (Nussbaum 2011).

^{xv} Nussbaum's definition of "Affiliation" from *Creating Capabilities* consists of (A) Being able to live with and toward others, to recognize and show concern for other human beings, to engage in various forms of social interaction; to be able to imagine the situation of another. (Protecting this capability means protecting institutions that constitute and nourish such forms of affiliation, and also protecting the freedom of assembly and political speech.). (B) Having the social bases of self-respect and nonhumiliation; being able to be treated as a dignified being whose worth is equal to that of others. This entails provisions of nondiscrimination on the basis of race, sex, sexual orientation, ethnicity, caste, religion, national origin (Nussbaum 2011, 34).

^{xvi} Fishery ecosystems reflect what Fish et al. describe as cultural ecosystem services. This is the idea that an ecosystem services framework for conservation ought to include the cultural role that ecosystems play for the people who inhabit them. Their model of cultural services includes environmental spaces, cultural practices, cultural benefits, and cultural goods. They assert that culture may be critical to frameworks of wholistic resource management; however, at this time, this concept is largely theoretical. This idea provides a frame for considering fishing's benefits as an occupation offering value to the natural world and ecosystems on which it relies.

^{xvii} Their review includes the social wellbeing approach described in the previous paragraph, along with Economics of Happiness, Poverty and wellbeing, Capabilities approach, Gender approach, Human rights approach, sustainable livelihoods approach, vulnerability approach, and social capital approach.

^{xviii} In more directly addressing poverty in fisheries, Jentoft et al. note that alleviating poverty may require "strategies that are inherently in conflict" (Jentoft et al. 2010). For example, in developing a fishery as a means of poverty reduction, it is possible that its common pool resources, namely the fish and other aquatic resources, may be undermined, creating a "wicked problem" much like conflicts of "tragic choice." Jentoft et al. argue that these issues require much broader political, social, and institutional reform. Moreover, the freedom of fishers, as taken from Sen's capabilities approach, to use their common

pool resources must be protected in development: “Limiting the freedom of small-scale fishers is obviously an issue of justice, particularly when poverty is the cause or outcome” (Jentoft et al. 2010).