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Banning Bottom Trawling: An Urgent Treatment for the Ocean

Commercially valuable marine species have been intensively fished for hundreds of years around the world. To yield higher fish products from fisheries, traditional hook-and line fishing was replaced by beam trawls in the 18th century and more efficient and industrialized otter trawls were implemented by larger fishing fleets at the end of the 19th century (Jackson et al., 2001, p.635). After another one hundred years of continuous trawling reaching off further and further from the land, a great negative impact on the marine ecosystem was finally observed. In year 2006, the United Nations proposed a full-fledged ban against bottom trawling on the high seas, but the appeal did not reach a consensus among the 192-nation members and the ban was not adopted (“Ban on 'brutal',” 2006). Bottom trawling, which is characterized as one of the most destructive fishing practice, has already been adopted in over half of the continental shelves worldwide ("Deserted Oceans," n.d). To prevent further negative impact, bottom trawling should be banned because it destabilizes and threatens the marine ecosystem, because it makes future fishing industries unsustainable, and because adopting bans on trawling benefits the level of livelihood in less developed areas.

Bottom trawling destabilizes and threatens the ecosystem in the way of destroying deep water coral reefs, which are the most comprehensive and complex ecosystems that provide

suitable living habitats for over 1300 species in the deep ocean (Roberts, Wheeler, & Freiwald 2006, p.545). Bottom trawling, often on the high seas, has severely damaged cold-water coral ecosystems and it will take several hundreds or thousands of years for a total recovery to the previous reef status (p.546). Evidence of trawling damage on deep sea corals is also confirmed by underwater audio and radio technology. Acoustic experiments have recently found trawl scars up to 4km long deep in 200–1400m under the sea surface , which are featured by scoured seafloor, pulled and moved rocks, and turned over sediment all along the Northeast Atlantic shelf-break (cited in Hall-Spencer, Allain & Fossa, 2002, p.507). As a result, the towed gears have caused enduring destructive effects on reefs in shallow European waters and have caused widespread damage to deep-water coral reefs offshore Norway and Tasmania(cited in Hall-Spencer et al., 2002, p.507).

In addition to the damage to coral, trawling undermines the physical and biological structures on the seabed, and further endangers the marine ecosystem. A study by Kumar and Deephi (2006) shows that bottom-trawl nets can tow and plow deeply in the seafloor, disturbing structures on the seabed, killing bottom water organisms, and flattening the manifold types of landforms that are the main factor maintaining the richness of biodiversity at the sea bottom (p.924). The great physical disturbance of trawling causes very dense dust particles that are lethal to many bottom water species. Jones (1992) explains that the high sediment load caused by trawling gears cannot be tolerated by bottom water communities (p.61). Jones further points out that the effect of sediment resuspension is persistent and the duration of the impact can be several decades (p.64).

Coral reefs and seabeds are indeed important ecosystems that are inhabited by thousands of fish species. As long-lived and slow-growing reef habitats and bottom water species are removed or killed by trawling, an overall decrease in diversity can be predicted (cited in Jones, 1992, p.63). The great abundance of the marine biodiversity is a treasure formed by nature in the past millions of years. A decline in biodiversity caused by bottom trawling severely destabilizes the marine ecosystem, which is surely undesirable.

Along with the adverse ecological effects, bottom trawling also produces negative economic effects since trawling results in a severe decrease in future commercial fish stock through by-catch, which makes the fishing industry unsustainable. According to Kaiser and Spencer (1995), the decreasing fish stocks have caused the necessity of bottom gear modifications in some waters, such as “longer beams, tickler chains and chain matrices” which extensively increase the chance and quantities of by-catching commercial fishes (p.31). Since most by-catch is unintended captures and does not have direct commercial value, they are discarded directly into the ocean. A report by Alverson et al. indicates that commercial bottom trawling causes at least 27 million tones of discards annually around the world, which is above half of all fish products consumed worldwide each year (cited in Kumar & Deepthi , 2006, p.923).

In fact, by-catch includes juvenile commercial species that will have market value in the future. In the South Indian states, about 6200 tones of juveniles fish are caught by trawl nets each year, and the dumping of discarded waste of large amounts of young commercial fish ultimately led to an economic loss to the fishery of the state (Kumar & Deepthi , 2006, p.925). Rather than

the direct killing of young commercial fish, trawling causes the degradation of commercial value of fish. A recent study by the United States National Research Council concludes that constant trawling change the composition of bottom water community toward “small opportunistic species” (cited in Watson, Revenga,&Kura,2006,p.103). The reason behind this composition shift of bottom sea community is that trawling subtracts larger targeted species, especially predators, away from underwater organisms and increases the quantity of smaller fishes that are commercially less important. (Kumar & Deepthi , 2006, p.926). Continuing trawling will very likely make future fishing practice less profitable until all commercial fishing stock is depleted. In order to keep the economic sustainability and sustain the availability of fishery resources, the current method of trawling should be stopped to relieve current ecological stress of commercial valuable species.

Since commercial bottom trawling has overconsumed current and future fishing stock, the conflict of resource allocation between industrialized trawlers and small scale fisheries was arisen. Banning trawling corrects this misallocation and benefits the economic status of small scale fishers, thus increasing their standard of livelihood. A report shows that in Indonesia, the constant poverty of the fishermen can be explained to a great extent by the problem of resource misallocation of fishery resources (Chong, Dwiponggo, Ilyas, &Martosubroto, 1987, p.462). According to Chong et.al, the Trawl Ban of Indonesia was introduced in 1980, which is targeted on rearranging the resources away from the trawl operators in favor of small-scale fishermen (p.458). Their post ban studies indicate that the ban effectively redistributes fishery use away from the trawl operators to the smaller fisheries, and the ban has a positive impact that involves a

rise in productivity per person (p.474); at the same time, the overall economic benefits in the aggregate level is observed (p.475).

The trawl Ban in the Gulf of Castellammare in Italy, according to research by Whitmarsh, Pipitone, Badalamenti and D'Anna (2003), also shows benefit to small scale artisanal fishery as a result both of increasing fish stock and the elimination of the formerly drastic conflict between trawlers and fishers (p.489). They conducted a one-decade observation which indicates an increase in the fish stocks within the trawl ban area throughout the decade, and the financial performance of the non-trawling vessels was good enough to retain in the fisheries (p.490). Furthermore, Whitmarsh et al. conclude that removing the trawl ban in the Gulf of Castellammare weakens current sustainability of fisheries and would result in over half the artisanal fleet of trammel vessels losing business (p.496). Trawl bans in Indonesia and Castellammare implies that highly efficient trawl gear can be removed without affecting long run production and productivity. If trawl bans are implemented in other developed countries, it would help relieve poverty without affecting the economy's performance.

Some might argue against trawl bans, citing evidence claiming a lack of injury to ecosystems from trawling. Schwinghamer et al. (1998) conducted a 3-year experiment on the impact of otter trawling on the bottom water habitat of the Grand Banks of Newfoundland where commercial fishing takes place (p.1215). Although a much higher trawling frequency than realistic commercial trawling, they observed that trawl tracks are hardly visible after a year; at the same time, the physical effects of otter trawling are temperate and recovery of habitats occurs in about a year in the experimented areas (p.1221). The finding of Schwinghamer et al. implies

that trawling may still be a permissible fishing method because of moderate level of disturbance and high recovery rate of bottom water community, but this finding is not really the complete picture. According to Jones (1992), the distinct tracks imprinted on the seafloor vary in different waters depending on the depth and flow rate of water movement, and a single trawl track in Eckernforde Bay, Germany can be observed for almost 5 years (p.61). Moreover, the recovery rate in some trawled areas is very slow. One study suggests that the time needed for the under water community in the north-west shelf to recover appears to be at least 15 years (Kaiser, Collie, Hall, Jennings, & Poiner,2002, p.126). The slow recovery rate, coupled with long-lasting disturbance to bottom sea ecosystem due to trawling, requires immediate actions to stop bottom trawling to help save a better future for the oceans.

Banning bottom trawling benefits the ecosystem, helps recover fish stock and maintain sustainable fishing practice, reduces conflict between massive fishing methods and small-scale fisheries without losing total economic productivity. An alternative way to replace bottom trawling is to redesign current nets to reduce by-catch and avoid contact with seabeds. In fact, advanced bottom sea navigation devices and by-catch reduction systems are already designed, but policies are still not well adapted to put new technologies into use (cited in Kumar & Deepthi, 2006, p.928). Policymakers should take actions to implement marine eco-friendly technologies in fishing industries, and ultimately replace the many fishing practices that have similar destructive impacts to bottom trawling. Banning bottom trawling is a considerate and wise decision both for the long life of the marine ecosystem and future human generations, of which everyone surely needs to take care.

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