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Threading the needle between sustainability and starvation



UNIVERSITY OF BERGEN



The Sustainable Development Goal 1 ‘No poverty’, 2 ‘Zero Hunger’ and 14 ‘Life below water’, forms a nexus around the availability of seafood. To reach the targets, we need to address the tradeoff between the current need for food and the future demand for sustainable management.

3 key points

- Eat lower in the food chain and eat the whole fish to avoid wasting valuable nutrients.
- Smaller fish are more resilient to overfishing and have higher productivity than larger fish increasing potential yield.
- Positive intervention can increase yields without risking undesirable side effects on the economy and nutritional security.

Introduction

There is a thin line between sustaining our environment, from land to air and water as a whole, and destroying it—understanding how we can sustainably manage the resources to maintain the ecosystem and avoid perpetuating hunger and poverty.

Fishing is an essential aspect of the survival ecosystem, especially in developing countries for people living close to water (lakes, rivers, and seas). The benefits stretch from economic to societal, such as food, nutrition, and employment security. The social importance of fish incentivizes fishermen to fish as much as possible which can lead to overfishing. Overfishing is a short-term solution, and encouraging a long-term horizon that keeps fish stocks at a sustainable level is crucial for long-term growth.

In developing countries, poverty levels and food insecurity are high. The educational level is lower, and local knowledge of sustainable fishing is lacking. Poverty is a contributing factor to poor education policies that pave the way to unsustainability. Educated fishers would have an increased understanding of how and what to fish to preserve the whole system of life underwater either.

The Gap:

1. Policies do not promote fisheries as a local industry to be run and managed by well-educated and informed individuals who would monitor the system at different levels.
2. Current policies provide few platforms to share experiences with other countries and communities with similar issues.
3. There is little knowledge of what to fish and what to eat of the fish to obtain the most nutrients and possibly yield larger fish stock.

Analysis

Recognizing the importance of fisheries for developing nations, either as a source of essential nutrients and protein or as works within the fisheries value chain, it follows that implementing regulations that reduce the amount of fish that fishers can take from the aquatic ecosystems might have severe undesirable consequences. For example, it could lead to increased food insecurity or unemployment.

At the same time, higher fishing intensities can increase the risk of overfishing of stocks, which can, in the worst case, result in stock collapse, leading to even more undesirable effects on food availability and the economy. The purpose of managing fish stock sustainably is to allow as much fish to be taken out of the water as possible without compromising the future production of the system.

Developed nations typically manage fisheries based on catch data combined with stock assessments by regulating total allowable catch. This method is labor- and cost-intensive, and therefore hard to implement directly into the more data-poor developing nations that lack the resources to spend on monitoring programs. In such areas, management is typically done by limiting gear types and fishing areas.

The question then becomes: how do managers best ensure that they are utilizing the fisheries resource as much as sustainably possible, without access to detailed survey data and robust catch-data? Targeting smaller fish lower in the food chain might be an essential tool.

Smaller fish from lower in the food chain typically have higher production rates and faster maturation, leading to shorter generation times. This makes them more resilient to overfishing, as they more readily replenish themselves when removed. Furthermore, for practical reasons, smaller fish are typically eaten whole. Eating whole fish rather than fillets is beneficial, as filleting removes essential nutrients such as zinc, iron, and calcium that the fish could have otherwise supplied. Catching an equivalent amount of fresh weight of smaller forage fish would generally lead to higher human nutrient consumption than catching larger piscivorous fish.



The Kibirizi landing site in Kigoma, Tanzania, is one of many sites along Lake Tanganyika where the small sardine-like Dagaa contribute greatly.

Conclusions

Fish provide a valuable source of micronutrients and proteins. When people eat lower in the food chain and eat the whole fish, less nutrients are lost.

Not only are smaller fish more nutritious, they are also more resilient to overfishing, which allows them to supply more nutrition with a lower probability of overfishing than their larger counterparts.

Focusing efforts on educational programs and information sharing provides a pathway to increased demand for smaller fish, allowing the fisheries to supply equal or more nutrients while increasing resilience to overfishing.

Direct policy intervention, such as prohibiting certain tools or areas, might have severe negative consequences limiting food availability and employment opportunities. By encouraging a shift in diet, the productive capabilities of aquatic systems might be increased without risking potential decreases.

Recommendations

Drive demand for smaller fish through information provision and education. Drive supply by encouraging fishing of smaller fish to increase fishery potential and future income.

Support local authorities in knowledge sharing on monitoring, efficient policies, and enforcement.

Promote fishery management as a science and communicate its benefits to both humans and the environment.

Further relevant SDGs:

IMPRINT

SDG Bergen Science Advice in collaboration with Bergen Summer Research School's 2021 PhD course

Relevance to the 2030 Agenda

Fisheries has the potential to contribute to SDG 1 'No Poverty' and SDG 2 'Zero Hunger', and must be sustainably managed to avoid compromising SDG 14 'Life below water'.

Authors

Erika Christie Berle, PhD Candidate and Research Fellow at University of Stavanger Business School

Henrik H. Jessen, PhD candidate, Department of Biological Sciences, University in Bergen.

Evelyn Kunda-Ng'andu, PhD Candidate and Research fellow, Centre for Infectious Disease Research in Zambia

Corresponding author

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bsrs@uib.no

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