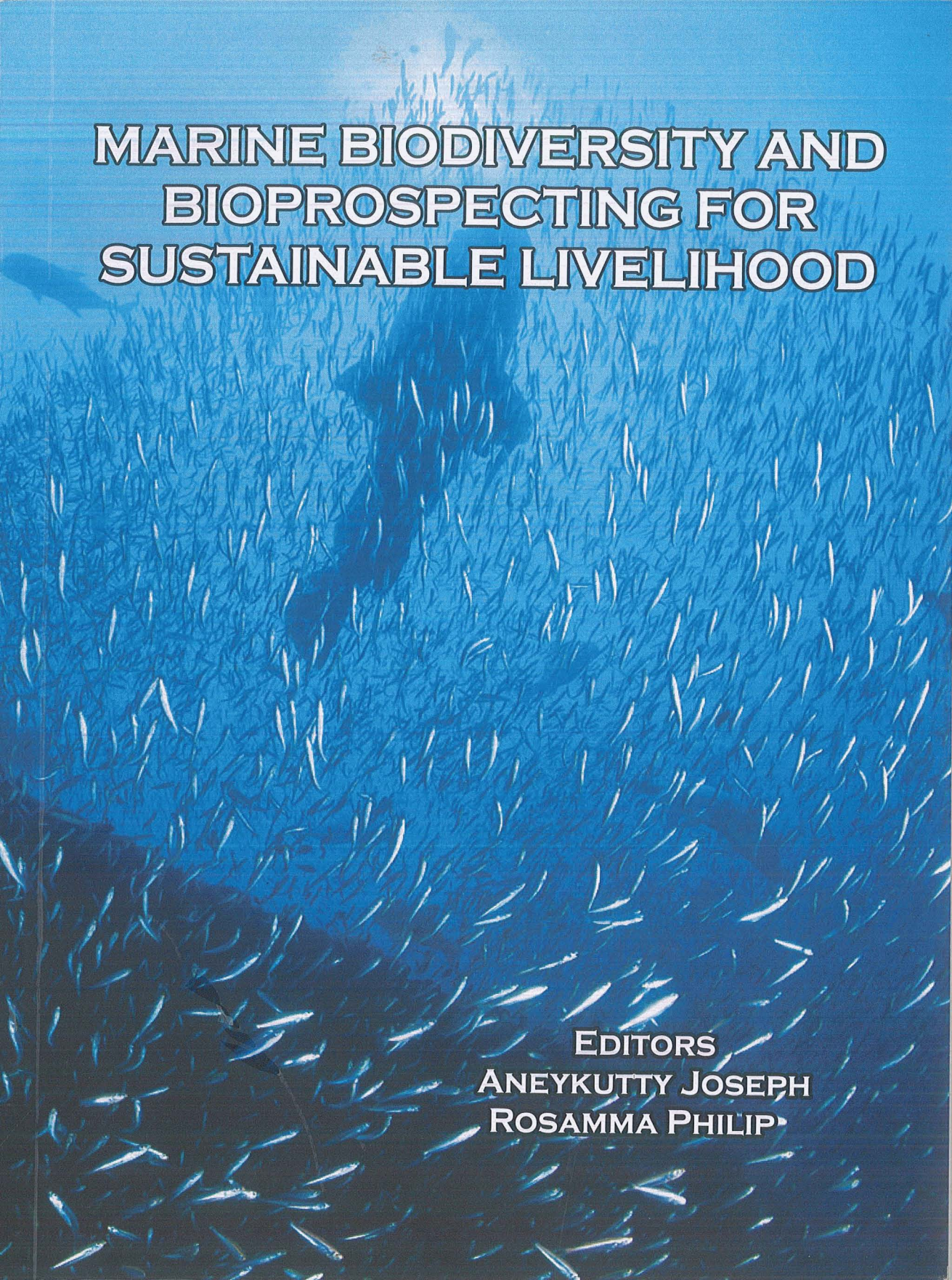
MARINE BIODIVERSITY AND BIOPROSPECTING FOR SUSTAINABLE LIVELIHOOD



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Marine Biodiversity and Bioprospecting for Sustainable Livelihood

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Conservation of Marine Fishery Resources Through Eco-labelling in India

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Introduction

Severe habitat loss and population declines of specieshave occurred in the oceans, leading to concerns thatfished populations may be at risk of extinction over large spatial scales. Three quarters of 62 depleted stocks worldwide continue to be fished at intensities too great to allow populations to recover. If the overfishing goes on for too long, the stocks may never recover. Exploitation rate which is the ultimate driver of depletion and collapse, if decreased, helps in management of the fisheries, setting the stage for ecological and economic recovery. A recent market based initiative for conservation and management of fish stocks is eco-labelling or certification.

According to the FAO, ecolabels are seals of approval given to products that are deemed to have fewer impacts on the environment than functionally or competitively similar products. The rationale for basic labelling information at the point of sale is that it links fisheries products to their production process.The goal of ecolabelling initiatives is to promote sustainably managed fisheries and highlight their products to consumers. Product claims associated with ecolabelling aim at tapping the growing public demand for environmentally preferable products.

Prior to certification, a set of 'sustainability' standards or criteria against which a fishery is to be evaluated must be developed. Achieving and identifying 'sustainability' in fisheries is a complex process. The acceptance and credibility of standards is closely related to how the standards were developed, the standards themselves, and the accrediting or certifying process by which organizations are evaluated against the standard. One of the most credible and widely used ecolabel is that of the Marine Stewardship Council (MSC).

What is MSC Certification?

Marine Stewardship Council (MSC) is a non-profit organization established to promote sustainable fisheries and responsible fishing practices worldwide. The MSC has developed a logo to inform consumers that when they buy seafood products with a MSC logo they are supporting healthier oceans and a healthier environment. Only fisheries certified to be sustainable can use the MSC logo. MSC supports development of sustainable marine fisheries by promoting responsible environmentally sound, socially beneficial and economically viable fisheries practices while maintaining the biodiversity, productivity and ecological process of the marine environment. Both the end customer and the fishing industry gain through this certification.

MSC environmental standards for sustainable fishing is based on FAO Code of Conduct for Responsible Fisheries (CCRF). MSC Certification is a set of Principles and Criteria for sustainable fishing which is used as a standard in a third party, independent and voluntary certification programme. These were developed by means of extensive international consultative process through which the views of stakeholders in fisheries were gathered. MSC has a strong and influential market presence. There are 8.8 million metric tonnes of seafood caught annually by MSC certified fisheries in 36 countries, which is almost 10%

of the annual global harvest of wild capture fisheries. There are 19,500 products with the MSC ecolabel on sale to consumers in 100 countries. There are about 3,000 MSC Chain of Custody certificate holders, operating in 34,500 sites that link the certified fisheries to markets. Market use of the MSC label is particularly strong in Western Europe and North America, and is growing quickly in Japan.

The three basic principles of MSC Certification

Principle 1

A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and for those populations that are depleted and fishery must be conducted in a manner that demonstrably leads to their recovery.

Principle 2

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species on which the fishery depend.

Principle 3

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional an operational frameworks that require use of the resource to be responsible and sustainable.

To determine if each principle is met, the MSC Fisheries Standard comprises 28 performance indicators. These are used by independent conformity assessment bodies (CABs) to score the fishery.To ensure the MSC program and its associated benefits are accessible to all fisheries including those from the developing world, the MSC developed a set of precautionary risk-based

indicators for the assessment of data-deficient fisheries - the Risk-Based Framework (RBF).

Some specific benefits of MSC certification

- Fishing industry: Recognition of good and heightened management of fisheries, preferred supplier status, newer markets and better pricing.
- Retailers and wholesalers: Commitment to sustainability, confidence in sustainability of product, meeting consumer demand.
- Consumers: Not contributing towards overfishing and ecosystem degradation and supporting the management effort.

Ashtamudi short-neck clam fisheries becomes India's first MSC certified fisheries

Due to concerted efforts by the CMFRI and WWF-India, the short-neck clam (*Paphiamalabarica*) fishery in the Ashtamudi Lake in Kerala received India's first Marine Stewardship Council (MSC) certification in November 2014 which will help boost sustainable fisheries and also protect the ecosystem. The certification to Ashtamudi short-neck clam fishery – only the third fishery in Asia to have received this recognition – will help in implementation of measures to ensure that this valuable resource is not over-fished and its ecosystem is protected.

The MSC certification was a joint effort by CMFRI, WWF, State Fisheries Department and the local fishing community. The certification demonstrates the power of collaboration between partners and the importance of a new council-based management system for clam fishery governance.

How did the Ashtamudi Short-neck Clam get MSC certified?

The short-neck clam (*Paphiamalabarica*) fishery of Ashtamudi Lake is a low-volume, low-value small-scale fishery with an export market. About 20 years ago when the fishery was in a crisis with low biomass and dwindling catches, the advice by CMFRI to regulations was followed by the fishers as self-regulation. This resulted in steady yields from late 1990s and these informal self-regulations were formalized through the creation of the Ashtamudi Clam Fisheries Governance Council under the District Administration. This paved way for the successful certification of the fishery. Let us see how the management measures and regulations for this small-scale fisheries helped to get this coveted certification.

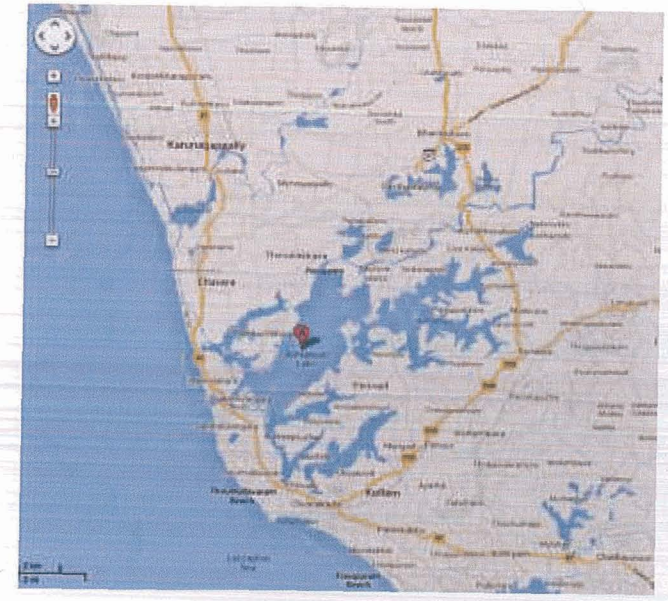
Background of the Ashtamudi Lake Short-neck clam fisheries

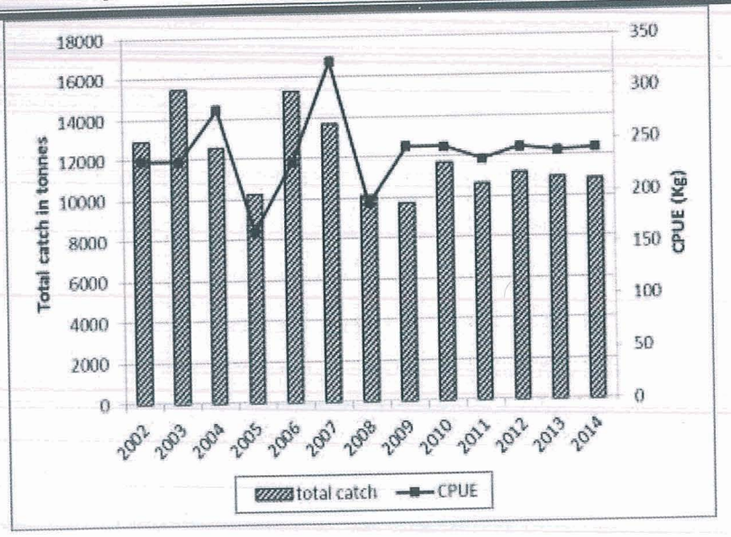
The Ashtamudi estuary is the second largest estuarine system in Kerala with an area of 61 Sq.km and located between latitude 8°45' - 9°28' N and 76°28' - 77°17' E. This is the second largest wetland in Kerala and one of the deepest estuaries among all the other estuaries. It is a RAMSAR site and designated as a wetland of Importance. Ashtamudi Lake in Kerala (southwest coast of India) contributes approximately 80% of the overall clam export trade in India, providing livelihoods for at least 3,000 local people.

Short-neck clams or yellow-foot clams (*Paphiamalabarica*) in Ashtamudi Lake are fished by hand rake, diving and handpicking by 1,000-1,500 fishers.Commercial fishing for clams started about 30 years ago – prior to that there had been little demand for them outside the immediate local area where the clams have been eaten for generations. The growth of the commercial fishery was fuelled by demand from export markets and the interest of local fish

processors in cooking, freezing and exporting the clam meat to customers in Vietnam, Thailand and Malaysia in the 1980s and 1990s.

The export of clams started in 1981, and by 1991 the catch had reached a peak of 15,000tonnes (t) per annum. This declined to 5,000t in 1993. At that time the fishery was largely unregulated, and the fishermen demanded action against indiscriminate fishing practices. The local administration tasked the CMFRI to study and suggest management measures to sustain clam stocks in the Lake. Based on the CMFRI's recommendations, regulations requiring nets with a minimum mesh size of 35 mm, a minimum export size of 1400 clams/kg, and a ban on fishing actiyity from December to February, the peak breeding season for clams were adopted by fishers as a self-regulation without formal government regulations. These measures showed immediate effects, and the clam fishery has sustained landings of around 10,000t pa for the past decade, with relatively stable CPUE in recent periods (see below chart on catch and catch per unit effort).





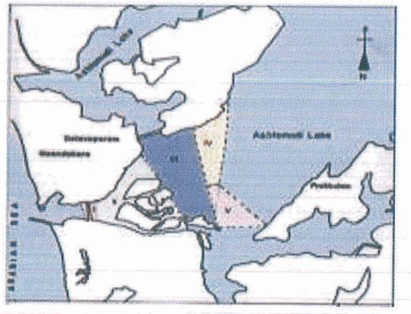
These self-imposed conservation measures have shown positive effects since 1994, when production began to increase considerably, allowing the fishers to sustainably exploit short-neck clams. Recent data collected by CMFRI indicate that the stock is currently being fished sustainably, with an annual catch of approximately 12,000 t which is close to the maximum sustainable yield. The fishery has a strong export market, sending, frozen cooked, freeze-dried, and dehydrated clam meat to Japan, Vietnam, Thailand, Australia and United Arab Emirates.

Highlights of Clam Fisheries Management Plan

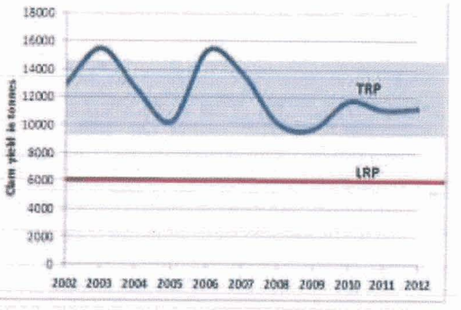
Considering the intense fishing pressure on the clam resources of Ashtamudi Lake, the CMFRI came out with a Clam Fisheries Management Plan (CFMP) for the Ashtamudi Lake (Mohamed et al., 2013) which gives a broad framework for the scientific management and conservation of clam resources in the Ashtamudi Lake. The CFMP has the following recommendations:

- Part of Zone I, under and west of the Neendakara Bridge should be declared as a no-take zone for clams all through the year. This will function as a protective zone where in regenerations of stocks will take place continuously and this will also help re-populate clams in other zones. This zone can function as a CLAM SANCTUARY. The provision of Declared Fisheries Zone (DFZ) of the Kerala Inland Fisheries Act may be invoked for this purpose by the State.

- Seed clams below 20 mm APM should not be allowed to be harvested, and if harvested, they should be relayed. This size may be declared as the Minimum Legal Size (MLS) for harvest by the DOF.
- As a long-term conservation measure, hatcheries have to be developed within the next 10 years for breeding the clams and spats can be relayed in suitable locations (indicated above) in Ashtamudi Lake.



Clam fishing zones in Ashtamudi Lake



Target and limit reference points for clams

- Transplantation of clams from one estuary to another must not be permitted as the ecological effects cannot be easily judged beforehand. No species introductions should be permitted in Ashtamudi Lake without a comprehensive study by a research institute and permission of the SFD.

- A system of licensing of clam fishers in the Lake and registration of boats and gears used for clam fishing should be urgently carried out by the SFD.
- No mechanical devices should be permitted for the harvest of clams in the Lake.
- The CMFRI should conduct clam biomass surveys in Jan-Feb every year, and come out with estimates of fishable stock in the ensuing season. The CMFRI should provide sufficient information to generate a Total Allowable Catch (TAC) which can be later converted to individual quotas for fishers on an annual basis.
- The target and limit reference points (TRP and LRP) for exploitation of short-neck clams in Ashtamudi lake is set as 12,000 and 3,600 tonnes respectively. The control measures existing should ensure that the yield is at or around the TRP, and if the yield approaches the LRP then target fishing must cease to allow for rebuilding of stock.
- For effective management of the clam resources of the Ashtamudi Lake, a stakeholder council or Village Clam Fishery Council (VCFC) should be formed by the administration. This council should have representation from panchayat, Department of Fisheries, CMFRI, NGO's working in the area and clam societies. They should meet once in a quarter. The Council should have powers to debate and formulate rules as necessary for effective management of the clam fisheries.
- Following the participatory mode 3-tier fishery management system, the VCFC should report to the District Fishery Council (DFC) and ultimately to the State Fishery Council (SFC). The modalities of such a management regime should be enunciated by the DOF.
- The southern and northeastern parts of the Ashtamudi Lake are currently devoid of clam populations. It was not so many years ago. This has

happened due to deterioration in water quality in these regions through increased urbanization and unregulated waste dumping. This part of the Ashtamudi Lake needs special focus to improve the habitat quality for ecological sustainability of the Lake.

- Zones I to V as demarked in the map may be declared as Clam Management Area (CMA) of Ashtamudi Lake by the DOF for the purpose of framing necessary rules and regulations to govern the clam fisheries by the VCFC.
- Depuration of clams for hygienic consumption may be encouraged. This could be done by the fishers or processors or agents. A scientific depuration and meat shucking process has been developed by CMFRI and this maybe initially financially supported by the DOF as a scheme.

How Ashtamudi Clam Fisheries Conforms to EAF of FAO

The ecosystem approach to fisheries (EAF) and its many variants as enunciated by the FAO differs from most fisheries or environmental policies, which tend to focus on single species or habitats, in that the interconnectedness of ecological, social, and economic parameters for developing local and regional management of an ecosystem is explicitly recognized. Despite the soundness of the concept of EAF, there are few successful examples of well managed fisheries using the approach. Even when EAF is ecologically and institutionally attainable, multiple problems can arise from competing interests among stakeholders, undeveloped or inappropriate governance structures, poor science, or lack of political will. The situation is perhaps more complex in the tropics due to the large number of co-occurring species, gears and fishers. In the developing world, this is compounded by the lack of a governance structure, and in places where they do exist, the lack of its implementation.

Let us examine how the Ashtamudi Lake short-neck clam fishery complies with the EAF principles and operational framework.

Table. Status of EAF operationalization for Ashtamudi Lake Yellow-foot Clam fisheries

EAF principle	Operational Framework	Implementation Status
Precautionary approach	Fishery management plan in place	Practiced
	Target and limit reference points (TRP & LRP)	Practiced
	Mesh size limits	Practiced
	Effort control – closed season	Practiced
	Size restriction - Minimum Legal Size	Practiced
	Closed area – clam sanctuary	Recommended
Adaptive management system	Annual biomass surveys leading to recommendations to the governance council	System in place
Principle of compatibility	Linkages to other resources	To be developed
Principle of participation	Twenty member Ashtamudi Clam Fisheries Governance Council (ACGC) with multiple stakeholder representation	Practiced
Using incentives	Negative incentives exist, positives not developed	To be developed
Sectoral integration	ACGC provides scope for representation from multiple stakeholders apart from core sector, for example, tourism, exporters etc	Practiced

The above table indicates that many of the EAF principles are applied in the Ashtamudi Lake Yellow-foot Clam fisheries, but much more needs to be done. The compliance to some of the precautionary principles has ensured that the fishery is carried out in a sustainable manner for the past several years. The formation of the governance councils proved to be tough, as the local self-

governments could not comprehend the concept and its eventual benefits and also were not willing take up the responsibility of governing the resource. Finally administrative support from the top-most district authority was necessary to form the ACGC.

Ecological Services of Clams in Ashtamudi Lake

Since Ashtamudi Lake is a clam dominated estuarine ecosystem, we considered clams as the key species controlling the bio-physical processes in the system. Although clams live buried in the sediment (in-fauna), their unique filter feeding behaviour influences the productivity and the bentho-pelagic coupling in the ecosystem. We used the CLAMFIL model, and made two scenarios. Scenario-1 when there is good clam fisheries management where the yields are maintained at 12,000 t ± 20%, and scenario-2 when there is poor clam fisheries management, where yields are close to the LRP. Scenario-2 can happen due to overfishing or poor recruitment owing to adverse environmental conditions. In Scenario-2, we assumed that larger clams with higher filtration capacities are not present in the beds.

The scenario-1 shows that the clams would take ~139 days to completely filter the entire lake water, while in scenario-2 it would take almost double or 277 days. In scenario-2 where the clam biomass is considerably reduced (halved), and also when large clams are absent, the eutrophication index of the ecosystem is likely to be considerably higher. This would seriously impair the water quality of the lake and affect all resources living in it. This in turn, would affect the livelihood of fishers.

Further Reading

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