



Working Paper No. 17

Research Area: Development

Governance of Yellow Foot Clam: A Case Study of Ashtamudi Lake in Kerala

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August 2020

Azim Premji University

Ajithraj R. (2020).

Governance of Yellow Foot Clam: A Case Study of Ashtamudi Lake in Kerala
(Working Paper No. 17).

DOI Link: <https://doi.org/10.61933/wps.17.2020.8>

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Governance of Yellow Foot Clam: A Case Study of Ashtamudi Lake in Kerala

Ajithraj R.



Abstract: *Yellow foot Clam (Paphia malabarica) fishery of the Ashtamudi lake, one of the deepest lakes in Kerala supports the livelihoods of thousands of clam-collectors in the region. These clams are highly demanded in the international market and it enables the clam-collectors to generate their income through export began in late 80s. An increased export market demand exerted a lot of pressure on the resource which ultimately led to the depletion of clam resources. As a response to this unexpected decline in resource size and lost income, the clam collector community in Ashtamudi came forward to address the issue by forming a collective of clam-collectors at the village level.*

As a management strategy, they voluntarily abstained from fishing during the breeding season and demanded management of resource through a participatory mode of governance. After years of experience in the management of resource through voluntary measures, Ashtamudi clam resource entered a new regime of resource management. It got certified as “sustainable” resource by the world’s largest marine wild-catch certification program, the Marine Stewardship Council (MSC) which promotes the governance of marine fisheries resources through market incentives. This study is an attempt to understand these varied and unique governance regime experiences of clam resource from participatory to market-based systems and the implications of these governance regimes in the property rights, livelihoods and social development of clam-collectors of Ashtamudi.

Keywords: *Yellow Foot Clams, Marine Stewardship Council, Natural Resource Management, Fisheries Communities, Fisheries Governance.*

Governance of Yellow Foot Clam: A Case Study of Ashtamudi Lake in Kerala

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Introduction

Fisheries governance across the globe has been undergoing a series of changes in its scale and philosophies. The flurry of activities on the theme of fisheries governance that took place at the beginning of the 21st century underlines the new development thinking for this sector. These activities mostly include the individual monographs, which analyses the current systems of governance in specific national or regional contexts, to collections of work organized around the themes of co-management and participatory governance (Symes, 2006). Governance is a complex concept and its essence cannot be expressed completely through a two-line definition. However, it is good to start with a small definition. Kooiman and Bavinck (2005) suggested that: “Governance is a whole body of public as well as private interactions taken to solve problems and create societal opportunities. It includes the formulation of principles guiding those interactions and care for institutions that enable them.” (Kooiman and Bavinck, 2005).

Governance initiatives have evolved in different forms and shapes over the past few years. The most recent innovation in this sphere is that of eco-labels and certification standards, which use market incentives to govern resources. Several international players and certification organizations have suddenly sprung up to promote market incentive-based governance mechanisms against the state directed resource management initiatives. The MSC, a global, non-profit and independent organization working towards reversing the decline in global fish stocks using market incentives, is one among them. The organization leads the sustainability certification program in the wild-caught

¹ I am thankful firstly to members of the fishing community and the officials of Kerala State Fisheries Department, Ashtamudi without whose assistance and cooperation, this work would not have been possible. I would also like to thank Azim Premji University Working Paper Committee members for encouraging me to publish this work. I am grateful to Dr. Purnendu Kavoori and Dr. Chitra Ravi for guiding me during my research work. I sincerely thank Prof. S. Vishwanath for his advice on writing this working paper.

fisheries sector. The term governance has acquired new dimensions, and it has extended its scope beyond its conventional understanding of policy making.

Currently, there is only a single fishery in India, which has been certified by any international certification standard, and that is in the Ashtamudi lake in Kerala. The yellow foot clam fishery of Ashtamudi, the second-largest estuarine system of Kerala, is a source of income for over three thousand people locally. The yellow foot clams or the short-necked clam (*Paphia malabarica*), locally known as “Poovan Kakkar,” is also a major fishery product in terms of the value it generates through trade. A set of specific studies conducted by CMFRI (Central Marine Fisheries Research Institute) in 2009 estimated that 80% of India’s clam exports are from Ashtamudi, with over 542 tons of clam meat valuing over US\$ 1.15 million exported annually (Mohamed and Malayilethu, 2015). The immensely significant export value of the clam and its disproportionate share in the national trade makes Ashtamudi the clam capital of the country.

The story of the clam fishery in Ashtamudi is a remarkable one. It involved a series of events, which touched upon various aspects of the resource system, including the socio-political and cultural life of people. The fishery in Ashtamudi is homogeneous in terms of the scale of production and technologies employed. Socio-culturally, the system is very small and highly homogenous in its characteristics. The story of resource governance of the Ashtamudi clams began with a resource crisis that the community encountered in the early 1990s, owing to an increased export demand for clams from South Asian countries. At this juncture, the CMFRI intervened in the issue following a request by the local administration in Ashtamudi. CMFRI, the institute that pioneered the process of stock assessment and fisheries resource management in India, came up with a resource management plan for Ashtamudi, which suggested management measures such as temporal closure of the fishery during the breeding months, setting a minimum legal size for the clam harvest from the lake waters, planning and executing less destructive and environment-friendly gears for the species, and declaring a “no-fishing” zone in one area of Ashtamudi. To bring their fishery back to the normal state, clam collectors mobilized and agreed to follow the recommendations put down by CMFRI, which included the temporary closure of the fishery for three months, and this is still being practiced by clam collectors.

In the recent past, the World Wildlife Fund (WWF) sponsored the clam fishery to get certified by the sustainability certification program by MSC. “It is a small fishery in terms of the geographical span and output volume, however, has some complex governance arrangements”. Ashtamudi has a unique story, which has been presented as a case study to look at how communities reconciled different forms of governance systems with distinct characters and philosophies.

This paper attempts to briefly discuss the history, experiences and challenges that communities have with the governance of yellow foot clam fisheries in the waters of Ashtamudi lake. For this study, case study method has been followed to map and document the resource system and its characteristics.

The study is also looking into the changes in the production system, characteristics of the resource system, structure and value systems, power centres and its role in resource governance. I have used eight design principles formulated by Ostrom (2015) for the management of the commons that have been used to character the clam resource.

Despite a few studies on socioeconomic characteristics of Ashtamudi and size of the clam stock, there has not been much comprehensive work on the governance of fisheries in the Ashtamudi waters. This study offers the reader a broad perspective on the small-scale clam fisheries governance in Ashtamudi. Alongside I have also discussed the experiences of clam collecting community with sustainability certification programs in Ashtamudi.

Methodology and Area of Study

The study was carried out among clam collectors and other stakeholders of the Thekkumbhagam village of Ashtamudi where yellow foot clam collection is the major livelihood activity. It was a qualitative study intended to learn and understand the perceptions of clam collectors and other stakeholders about the clam resource system and its governance. I identified semi-structured interviews as the ideal tool for qualitative data collection in Ashtamudi. Interviews were conducted with different stakeholders who directly or indirectly were involved in the clam fishing. The stakeholders included fishing community, civil society members, politicians, government officials, clam fisheries experts and scientists, traders and religious leaders.

I have also used secondary sources to understand the clam fishery and stories on the governance. Individual interviews were helpful in collecting general information and perceptions of people on the clam fishery. A few participatory observations were also done to know the nuances like power dynamics and the stakeholder relations management.

Ashtamudi Lake

Ashtamudi Lake is the second largest estuarine system and the deepest wetland in the South Indian state of Kerala. The estuarine system of the lake covers a total area of 61 km², which is located between latitude 80° 45' – 90° 28' N and 76° 28' – 77° 17' E. The rich diversity of organisms, and its designated significance as a wetland qualified Ashtamudi as a Ramsar site in 2002 (Sengupta, 2015 and Mohamed & Malayilethu, 2015).

The wetland lies 145 kms. South of Kochi, the major port of Kerala. It is connected with the Arabian sea throughout the year (Mohamed et al., 2013) and the tidal incursion into the wetland reaches 4-5 kms. inwards into the wetland side where salinity is significantly larger. However, the wetland largely remains as a freshwater body.

The clams are widely available on the south-west coast of the estuarine waters, mainly distributed across the bar mouth surrounded by Neendakara and Dalavapuram villages in the north,

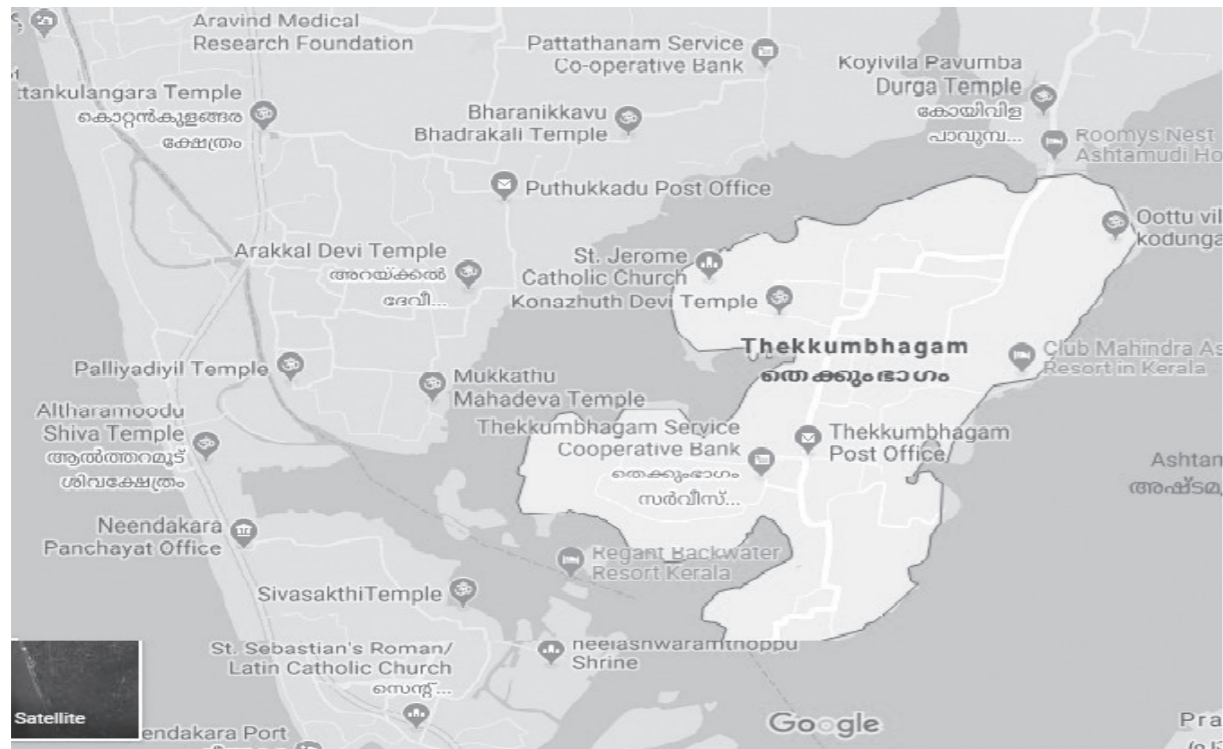


Fig 1: Google maps

Sakthikulangara village in the south, Chavara Tekkumbhagom in the east. These villages together constitute about 173 hectares (1.73 kms.) of the area in the estuary, where clam collection primarily happens; however, the clam bed extends to over 1200.78 ha of the lake (Appukuttan et al., 2002). This study was conducted in the Thekkumbhagam panchayat where the clam collection is very active than any other villages (Ram Mohan and Velayudhan, 1998).

Clam Collection Technology

The clam collectors had locally developed technologies for harvesting the resource from clam beds in the lake. Clam beds are unique and the spats (young ones of clams) settle and grow into bigger ones in the shallow regions of the lake. These beds are muddy and have multiple layers, which are constituted with soil, living clams and dead shell. A graphical representation of the clam bed developed using the information collected from the fishing community is given below (figure 2). The clam collectors usually follow four different methods for collection in Ashtamudi (Andrews and Appukuttan, 2014).



Fig 2: Clam bed layers in Ashtamudi lake

The clam collectors usually follow four different methods for collection in Ashtamudi (Andrews and Appukuttan, 2014).

Broadly the clam collection methods can be categorized as:

- Handpicking and diving
- Dredging or scooping

Hand-pickers: They collect the clams manually from the shallow clam beds of the saline part of the lake. They won't use any gears other than those made to protect the hands and legs of clam collectors who are involved in clam collection. In this method, the clam collectors pick out the clams buried under the mud after removing the sand using their feet or a metal piece from waist-deep water. The collected clams are deposited in the net bags strung around their waist. An individual hand-picker on an average collects 40-50 kg. of clams from the daily operation of 3 to 4 hours (Mohamed et al., 2013). Among the hand-pickers, some people use engine powered dugout canoes for operating from deeper areas of the lake. Such engine powered crafts have two to three divers on-board who dive deeper to a depth of over two-three metres.

Dredging: Dredging is another prominent method, which is being employed for clam collection. The process involves a locally developed dredging gear, made from long steel pipes and nets of recommended mesh size of 40 mm. It resembles a mini trawler and clam collectors who employ this gear are called dredgers. Dredgers operate in the clam bed with three collectors on board. The operation starts after one collector in the boat immerses the steel pipes into the mud and drags the net in the mud. The second fisherman assists him in the process of dragging the net using the steel pipe handles. A third member of the crew remains on the boat and helps to pull the net back to the boat after dredging and separates the clams from the mud collected in the gear. It is estimated that a crew of three collectors can collect 300-350 kg. of clams in five-seven hours of operation every day. The collected clams are taken to the clam collection points around the Ashtamudi lake, where collection agents or the middlepersons procure the catch directly from the collectors. Further, the agents pack the clams in a jute sack, each weighing 70-80 kg. The packed clams are transported to buyers who contact the middlepersons. The middlepersons keep the records of these transactions, including accounts for clams procured from each fisherman. These accounts are used to calculate the payment to be done for each collector, considering the market value as the standard.

Clam Collectors' Profile and Supply Chain

Clam collection has, directly and indirectly, been supporting the livelihoods of over 3,000 people in Ashtamudi. Among them, a thousand individuals are involved in active fishing, processing of clam meat and its marketing.

Clam collectors have some abstract ideas around where the collected clams go and are utilized. Interviews with the collectors revealed that a significant share of 30% of the total landed clams have been sold in the local market. Similarly, the middlepersons transported around 40% of the total collected clams to other states of the country. These figures of the domestic market (other

states) and local markets suggest that the remaining 30% were sent to the international market, especially to south-east Asian countries. These figures, however, can vary depending upon the changes in demand for the product in various markets.

Although a share of 30% is being exported in terms of quantity, most clam collectors are not very satisfied with the value received from their agents who source the clams for exports. They found local consumers value their effort and are willing to pay more for the clam meat than the exporters. However, at present the clam collectors must depend a lot on the middlemen and exporters to market their product, as they procure the bulk quantity of over 70%, of the total collected clams by clam collectors in Ashtamudi.

Although the sale of clams with shell (whole clam) is predominant in Ashtamudi, there are local clam processing sheds where the meat is prepared for local consumption sometimes even for exports. These processing units after the collection of meat from clamshells or shucking produce a lot of shells as a by-product which fetches a huge demand in calcium carbide and lime production units in Tamil Nadu (Appukuttan et al., 1987).

Story of Ashtamudi clams

During the early 1980s, Ashtamudi clams were not in demand in the international or domestic markets at a scale that is seen today. It was only the local community who used to collect clams at a minimum quantity for local consumption. However, Ashtamudi clams with an abundance of calcium in their shells caught the attention of lime production units of Tamil Nadu. For them, shells are potentially cheap raw materials for the industry, and this has raised the interests to utilize relatively unexploited clam resources of Ashtamudi. The state government authorized the Department of Geology and Mining to issue the license for 'mining' and the management of the resource. Subsequently, clams became a source of mineral-like other mineral ores. However, the government officials who looked after the mining and geology department identified clams as non-living organisms, and hence a raw material for industrial units. Subsequently the clam collectors turned shell miners for the industrial units. Nothing stopped clam collectors from mining the raw material which is a live organism. They exploited the resource indiscriminately; collected both the juveniles and the adults and sent it to the industrial units for lime production.

The commercial clam fishery of Ashtamudi started with the export of the clams to Southeast Asia countries in the mid-1980s. Increased demand from the export market in the following years led to the harvest of more clams for meat. Being convinced about the immense export potential, clam collectors in Ashtamudi developed methods such as hand rake, diving and hand-picking to meet the growing demand for clams. Alongside, the local fish processors showed an interest in value addition of the resource through cooking, freezing, and exporting the processed clam meat to customers in Vietnam, Thailand and Malaysia (Mohamed and Malayilethu, 2015).

In 1981, the clam export touched 200 t in quantity, and it rose to new heights of 5,436 t in 1982. The average annual landing from 1982 to 1992 was 6,800 t with a peak of 10,000 t in 1991 (Mohamed and Malayilethu, 2015). Primarily, owing to the export pressure, the production declined drastically to the range of 5,000 t in 1993. This unexpected decline in output disrupted the local economy of Ashtamudi, which had already evolved by creating a strong dependence on the clam resource. The collapse of the resource availability led to a chain of events. A fishery collective known as Swatantra Matsya Thozhilali Sangam was formed. The organisation, at that period was functioning as an independent organisation without any affiliation to a political party. The collective approached the local administration and district administration to find a solution for resource crisis that people were grappling with (Appukuttan et al., 2002). The Fisheries Department and panchayat administrators were the mediators for discussing the issue between district administrator and clam collectors. The district authority convened a meeting of all the stakeholders of Ashtamudi, which included scientists from the Fisheries' Research Organizations to find ways of governing the resource sustainably.

Solutions in the Making

Considering the demands of clam collectors, the local administration asked the CMFRI, Cochin to study the status of the clam fishery and suggest management measures to revive and sustain clam stocks in the lake. The district collector held a meeting with scientists and clam collectors to design strategies for natural resource management in Ashtamudi. CMFRI scientists, after studies and consultations with stakeholders, recommended certain regulations on the way fishery functions. An expert panel of scientists after their detailed studies suggested certain regulations regarding the mesh size of the nets being used by clam collectors. However, the most difficult policy suggestion was the temporal closure of the fishery during the months of clam breeding.

Clam collectors who were already grappling with resource crunch readily agreed to the CMFRI plans as they perceived the need for such an intervention on the ground. For the first time, district collector, Linda Jacob with the request of all the stakeholders ordered to ban the clam collection from November to January in 1993. The practice continued in subsequent years, in which the clam collectors internalized and ritualised the practice of temporal closure practice. Initially, the ban was meant for one month, but it got extended to three months from December to February, which is the breeding period of the clams. Every year, the ban is formally announced with the executive order from the district collector. People from the clam collecting community and other stakeholders take initiative in this regard. Once the Collector orders the ban, the Fisheries Department informs all the clam collectors through public addressing system. People in Ashtamudi are aware of the negative impact that the clam collection can inflict on the resources if they violate the order for clam collection. There is no other mechanism in place to check whether any violation of the order occurs. But the fisheries department does boat patrolling occasionally to monitor the situation.

Additionally, to curb the pressure from the export market, scientists recommended range for clams for export. Following this recommendation, exporters restricted the procurement of clams to size measuring a count² of 1400 clams/kg. Since the 90s the clam management programs in Ashtamudi have been carried out jointly by the district administration, clam collecting community and CMFRI scientists. All the clam collectors in Ashtamudi were members in the group Swatantra Matsya Thozhilali Sangham (Independent Fisher's organization) which do not exist in Ashtamudi today. However, the collective was instrumental in implementing the recommendations of CMFRI for fisheries management when the resource system was reeling under the pressure of declining. The clam collectors' collective had to disintegrate following the increased politicization of the organization and apparent attempts of groups having certain political inclinations to seize the power.

The fisheries management programs, including temporary closure of fisheries in Ashtamudi have been going on for the past two decades through voluntary and sincere efforts of clam collectors. Fisheries department officials often prefer to call the annual fishery ban exercise in Ashtamudi as self-imposed by the community. The program has been regarded as Asia's first voluntary ban on fishing by clam collectors themselves. These management measures immediately reflected in the stock size of the clams as the fishery rebounded to its normal levels and enabled sustained and stable landing of approximately 10,000t per year (Mohamed and Malayilethu, 2015).

New Developments and Clam Fishery Governance

In 2013, the district administration with the recommendation of CMFRI drafted a Clam Fishery Management Plan for Ashtamudi Lake (Mohamed et al., 2013). The Management plan instituted a new clam resource governing body called the Village Clam Fishery Council (VCFC), which involves many stakeholders of Ashtamudi clam fishery. The clam collectors, middle-persons or clam agents, fisheries department officials, CMFRI scientists, local administration, civil society members and NGOs are involved in the clam council. The establishment of VCFC is considered as a significant step by the authorities and people towards responsible and sustainable management of resources. In 2014, the fishery was certified as sustainable by the MSC as per their sustainability standards. VCFC and MSC certification are discussed in detail in the coming sections, emphasizing on the governance of the resource.

Characterizing the Governance of Ashtamudi Clam Resource Management

Clam resources in Ashtamudi have been shared and used by clam collectors in Ashtamudi for the past two to three decades. Over these years, the community evolved its ways of managing their resources. The resource crisis in the 90s and the strategies that people adopted to overcome it has been mentioned in the previous section. However, it is imperative to analyse the evolution governing institutions in the fishery. This section will mostly discuss the institutional arrangements in the fishery.

² One count means the number of clams required to make total weight equivalent one Kilogram

I would be drawing on the design principles formulated by Ostrom (2015) for the governance of the commons, to characterize and describe the operation of clam fishery in Ashtamudi. The degree of flexibility that the design principles offers is useful in systematically analysing clam resource governance in the local context. Moreover, these designs principles-centred analysis help identify the overlaps in the complex socio-ecological system of Ashtamudi.

Principles

The following are the principle centred analysis:

Having a clear boundary over resource

The first design principle proposed by Common Pool Resources (CPR) theory is defining a clear boundary for the common pool resources to be managed. The boundary principle implies that institutions whose boundaries are congruent with the scale of the physical boundaries of a common pool resource are more likely to be successful and sustainable (Heikkila, 2001). Ostrom (1990:91) notes: "Without defining the boundaries of the CPR and closing it to 'outsiders,' local appropriators face the risk that any benefits they produce by their efforts are reaped by others who have not contributed to those efforts." A demarcated boundary of the resource can state where the resource users should go and where they should not. For Ostrom, a clear boundary over a resource system helps the users to determine their membership by including those who agree to use the resource according to their agreed-upon rules and excluding those who do not agree to these rules. A well-defined boundary is the first step taken by the community towards limiting access and developing greater trust and reciprocity. Ultimately, the design principle enables the participants and the resource users to identify who is in and who is out and whom to co-opt (Ostrom, 2008).

A clear spatial boundary is not defined in Ashtamudi for governance. Therefore, the resource users both from outside and inside cannot identify the Ashtamudi clam system as a different fishing zone. The system continues to be an open-access resource system, which allows anyone to operate in the water. Lack of clarity in such aspects might create confusion and conflicts between clam collectors and fishermen from 'outside' the clam collector's villages. The clam resource is fuzzy in distribution with changing salinity of the water. It is a slow mobile species also. In this regard, drawing rigid institutional boundaries is an impossible task for resource users and administrators. Currently, no governing instruments exist in Ashtamudi to accommodate the changing dynamics of the organism for redefining boundaries every time to make governance a smooth process. It is also a limitation of the first design principle, especially with its applicability to a large-scale resource, having mobility and interrelations with other natural resources matter, as has been described by scholars like Heikkila (2001).

The clam resources in Ashtamudi, however, have zones that are shaped and defined by scientists for samplings that are meant for scientific studies. These zones are not like the institutional boundaries defined by Ostrom, neither created by resource users as specified in her design principles. They

are also never meant for using explicitly for governance through institutions. Five different zones are defined for 172 hectares of area in the waters of Ashtamudi and, is solely based on the biophysical characteristics of water. These boundaries are unknown to many resource users as they are not part of the exercise of defining the boundaries. However, occasionally, these zones are also instrumental for scientists in strategizing the management plan for resources and come up with the required recommendations for better resource management (Mohamed et al., 2013). The declaration of the zone I (Figure 3) as “no fishing” (Andrews and Appukuttan, 2014) was one such strategic recommendation by CMFRI to build healthy stock as the bio-physical characteristics of the region suggest the zone is a fertile breeding ground and nursery for clams.

The zonation of the clam bed was done by the fishery scientists for conducting their surveys. It is not a boundary originally conceived for governance. Therefore, it won't work to exclude the fishermen from outside.

At this juncture, there are no active interventions in the planning to define the boundary to create an order and a sense of ownership for clam collectors by making it a distinct unit. Now, VCFC is planning to achieve it by issuing identity cards for clam resource users in Ashtamudi. The members believe that it is a way of formalizing the resource management system to help define the real users of the resource. Clam collectors are also very positive towards the new intervention, as they think it makes them distinct from other fishing communities who fish in the clam bed. On the flip side, some individuals challenge the validity and the power of an ID card issued through an informal platform to exclude 'other clam collectors' from the system. They believe an ID card cannot be a fix to make system distinct and less open access.



Fig 3: Zones in Ashtamudi for sampling (Mohamed et al., 2013)

Congruence between appropriation and provision rules and local conditions

The second design principle states that the rules for user allocation benefits should be proportional to inputs that are required from the users to maintain the resource sustainably. For that matter, the resource use rules, time of operation, place of operation, allowed technology needs to be accounted for. It is vital to clearly define who gets access to the resource at what quantity. Ostrom (2008) recognized the fact that the rules related to the distribution of benefits should not be inconsistent with the distribution of costs. Such a balancing act through properly formulated rules makes the participants more willing to contribute to keeping a resource system well maintained and sustainable (Ostrom, 2008).

If the distribution of the cost and benefits of the individual user is inequitable and disproportionate, it will turn a matter of frustration for the participants and may lead to more and more participants refusing to abide by the rules. Some users get all the benefits and pay a few of the costs; few of the others are willing to follow rules over time (Ostrom, 2008; Ensminger, 2000). Thus, this design principle also directly underlines the types of attitudes that are necessary to sustain a system over the long run. Alongside, the rules defined for the equitable distribution of the resource should account for the local realities. A reflection of the local condition is necessary as the norms can be varied in different communities.

As per the second design principle of Ostrom (2008), it is important to know who is allowed appropriate resource units; the timing, quantity, location and technology of appropriation (Ostrom, 2008). In Ashtamudi, at present, the VCFC is managing and appropriating the resources for users using the recommendations of CMFRI, which are developed using their annual stock analysis. However, there is no defined rule or system in Ashtamudi to appropriate resources institutionally through an authority. The authority of the district collector, mostly deals with declaring management measures such as fishing ban or mesh size regulations suggested by CMFRI.

The recommendations of CMFRI scientists are through their annual surveys in which they estimate the total size of the clam stock of Ashtamudi and determine the bio-economic factors such as Maximum Sustainable Yield (MSY). MSY is defined as the largest yield that can be taken continuously from a stock under normal environmental conditions (Reindorf et al., 2016). Fishery managers consider the extraction of resource beyond MSY value as unsustainable. The MSY value of the clam is estimated at 12,000 t, which means the council can appropriate 12,000 t of clams among all its users as suggested by the clam fisheries management plan of 2013. The current output is estimated as 11698.2 t in 2010, with an average production of 974.9 t per month. This shows the extraction level has not touched the recommended MSY value of 12,000 t. The value of MSY can vary according to the assessments, and it has been reported that the current levels of extraction are at 96% of the total MSY (Mohamed et al., 2013). It implies that the fishery is sustainable in terms of stock size available in the water and the scale of the harvest. The VCFC does not have any plans to increase fishing effort, or the number of boats employed in the waters as the fishing operation is almost happening at the MSY levels and the present appropriation of technology has reached its

saturation point (Mohamed et al., 2013). CMFRI used MSY values to determine and define a Total Allowable Catch (TAC) value, which is the maximum amount of clam that an individual fisherman in Ashtamudi can collect. At this juncture, CMFRI did not want to put a cap on the harvest of each clam collector using TAC value, as the level of clam extraction of everyone is far below than the determined quota size.

Apart from annual fishery holidays and fishing surveys, the scientific community within CMFRI, VCFC had brought up a clam management plan in 2013. The management plan is suggesting the restriction of fishing to five days a week. Clam collectors expressed their concerns about risking the income for a day in a week. But later, through the constant engagements with VCFC stakeholders, their discussions and negotiation encouraged the clam collectors to accept the recommendations of CMFRI scientists.

Using the recommendations and suggestions made by CMFRI scientists through these surveys, the District Collector, with the involvement of local people, initiated management actions such as the temporal closure of fishery and mesh size regulations for nets in use. The timing, quantity, location and technology for appropriation are being determined by CMFRI scientists and implemented through VCFC since 2013. In a nutshell, implicitly, the resource allocation in Ashtamudi has been carried out through scientifically defined bio-economic value system.

Collective choice arrangements

The third design principle is about the institutional arrangements for making collective decisions. For Ostrom (2015), individuals affected by the resource regime should make rules for their local circumstances and changing conditions. Conventionally, the rules for the management of the resources are made by officials who sit at faraway places. It involves a lot of assumptions, and it has been constrained by the lack of quality information (Ostrom 2015). CPR theory proposes a collective choice arrangement to make resource management more context specific.

At present, VCFC is acting as the pivotal decision-making institution on clam fisheries management in Ashtamudi. District Collector who has the powers of district magistrate is heading this institution with the backing of the State Fisheries Department. The institution is technically an informal arrangement, which does the enforcement of rules made, or implement decisions that are taken regarding the management of clams and the livelihoods of clam collectors. VCFC can better be identified as a platform than a rulemaking body or norm-setting institution, which facilitates multiple stakeholders to discuss various issues and concerns on matters concerning natural resource management. As an institution, VCFC is also acting as a gateway for fishers to reach out to district authorities for any kind of support during the fishing holiday or temporal closure.

The District Collector who heads the institution has both judicial and administrative powers to take decisions on matters concerning natural resource management. The chairmanship of the District Collector adds formal characteristics to VCFC which is an informal arrangement on technical

ground. Also it creates a sense of legitimacy among clam collectors that VCFC as a authoritative governing body. As an informal arrangement, VCFC also lacks bylaws or its constitution to define its activities and set objectives. A document includes, guidelines called, terms of reference which is the founding instrument of this institution. CMFRI and the state department jointly made this document, which underlines the need of representing the interests of fishers and other stakeholders (terms of reference, 2013). VCFC meetings occur quarterly under the chairmanship of the District Collector of Kollam. The final decisions are taken by the District Collector based on the opinion of the majority during the consultation process with all stakeholders. The simple majority is determined after a thorough show of hands procedure. There is no other voting system or any other means to reach a consensus.

VCFC

The stakeholders in clam fishery include clam collectors, officials, traders, processors to civil society members. VCFC council is constituted with 20 members involving the representatives from these stakeholders. The list of the participants and number of representatives from each entity have been given in the below table and the in the brackets (taken from VCFC notices for meetings and minutes of quarterly meetings)

Table 1: Members of VCFC

Government	Private sector	Civil society
CMFRI- Central Government agency (member-1)	Fisheries processing industry (member-1)	Local NGOs (member-1)
MPEDA- central government agency (member-1)	Clam agents and middle person (Procure clams from clam-collectors) (member-1)	Scientists (member-1)
State Fisheries Department (member-3)		International NGOs like WWF and MSC (member-1)
Gram Panchayat (member-1)		clam-collectors or clam-collectors (member-5)
District Panchayat (nominated member-1)		
Coastal Police (member-1)		
District Collector		
Department of mining and geology (member-1)		

From the above table it is apparent that VCFC has a diverse group of actors as members. The participants' numbers and their diversity in terms of the representation of multiple sectors correspond to the Polycentric nature (Driessen et al., 2012 and Andersson and Ostrom, 2008) of the resource governance in Ashtamudi. The VCFC members include entities from different governmental hierarchies (national, state and local), civil society organizations and NGOs such as MSC who exert considerable influence on the global fish trade. This imparts more polycentric character to the governance arrangement in Ashtamudi.

As a body which also concerns clam collector's welfare, VCFC tackled many issues, including perceived exploitative nature of advance payment system in favour of the monetary interest of agents and against the interests of clam collectors. An advance payment system allows clam collectors to borrow more money from the agents, but the clam collectors are obliged to sell their products to the same agent at an agreed-upon price while receiving the money from the agent. This system does not allow clam collectors to sell their products at the market price, although it's much higher than the price of the resource which both clam collector and agent agreed upon for advancing the money.

VCFC members, mostly representatives of the clam collectors, raised this issue in the council and demanded more autonomy and fair price for their products. Clam collectors are also worried about the continued monopoly of a few middle people/clam agents in Ashtamudi. Many of them in my interview stated that the monopoly of a few agents does not enable them to negotiate and demand more price and they want to end this situation.

Cooperative society for clam collectors in Ashtamudi

To break the monopoly and enhancing their negotiation powers, VCFC helped clam collectors to set up a registered cooperative society titled "Ashtamudi Kayal Kakka Vaaral Samithi" in 2017. Stakeholders believe that a cooperative society creates a sense of ownership for clam collectors over their resources and empower them to gain control over trade and pricing of the product. More than half of the total clam collectors in Ashtamudi are part of the cooperative society. Clam collectors must pay Rs. 500 or Rs. 1,000 to get five shares and 10 shares, respectively in the society with voting rights.

The society has given a lot of attention to the improvement of clam collectors. For that, they promoted the collection and trade of dead clam shells for traders from Tamil Nadu. The society also promised a system of paying a bonus for the shell collectors on an annual basis. However, a section of clam collectors finds the institution a highly politicized institution. Nevertheless, in the long run, VCFC envisages using the cooperative society as a platform where all clam collectors are a part of. VCFC also understands and foresees to use the co-operative society as a vehicle for the efficient enforcement of decisions made by the council on various aspects regarding the fishery.

Monitoring

A well-functioning resource system requires proper monitoring and enforcement of rules. The fourth design principle exclusively talks about the requirement of a monitoring system. Ostrom (2008) suggests that the resource conditions of well-monitored systems are far better than the resource systems without monitoring. Monitoring of resource will usually be done among resource appropriators themselves. However, creating an official position for resource monitoring is not the right means of monitoring. The monitors of most Common-pool resources are coming from the community only and they are accountable to others in the same community. Sometimes the users assume the role of monitors on a rotational basis (Ostrom, 2008).

Fishery monitoring in Ashtamudi has not been done by community members. Usually, it has been carried out by the Fisheries Department and other state agencies. The monitoring processes in Ashtamudi is not just confined to the resource system, but it spans to other related aspects such as collection technology, types of fishing gears, ecosystem, and fishing groups who take benefits from the resource. It can happen in both formal and informal ways. The formal way of doing resource management denotes the established and well-instituted process of monitoring through the State apparatus while informal monitoring refers to the execution of the process not through the State arm, but other ways without any formal character. At present, the monitoring mechanism in Ashtamudi does not have any written protocols or well-structured institutional mechanisms for monitoring of the resources. All the monitoring practices are not being coordinated or controlled by any single formal or informal entity. Similarly, clam collectors could not experience the existence of continuous or active monitoring of the resource during the fishing season as well. However, there are certain practices, which have been followed in Ashtamudi and have implicit implications with monitoring of the resource and the fishery there. Those practices are explained and their implicit connections with monitoring are discussed below.

Monitoring of the gear system

Fishing gears for clams is being monitored through formal and informal institutions. VCFC asked the fishermen to self-attest their gears that the fishing gears comply with the current fishery management program. After attesting the gears, they must submit it to the local Panchayat officials as well. It allows the Panchayat to monitor the standards and degree of compliance of nets with existing guidelines.

Monitoring of the health of the resource system and the stock

Right from the beginning of the clam breeding season, CMFRI conducts stock assessment surveys to estimate the values such as the potential number of clams that can be harvested and the MSY for the clam resource post-breeding season. Such surveys are also termed as the pre-season surveys and they serve the purpose of monitoring of resources. The pre-season survey is followed by another survey to inform clam collectors about the status of the resource after the fish holiday for three months. These surveys, and the insights they provide are instrumental in thinking about new ways of regulations or resource exploitation. The recently started practice of restricting clam collection to five days a week came as a recommendation by CMFRI. The decision came when the scientists identified a slight decline in stock size after the annual surveys in Ashtamudi.

Monitoring of the clam collection activity in the resource system

During the breeding period (temporal closure of the fishery) the fisheries department along with the police force (coastal police) does boat patrolling. If they sense any illegal activities against the executive order of the District Collector, they warn the clam collectors against collecting clam resource from the system. If the coastal police notices anyone engaged in the clam collection

during the ban period, they catch them and make them throw the resource back to the waters. There are no instances reported to the coastal police initiating legal actions against violators of the order of district collector to ban fishing. They monitor the resources daily using the boats of the Fisheries' Department. They give instructions to the clam collectors about the ban and request their cooperation to close the fishing activity for three months.

Monitoring at the marketplace

Kerala is the first state in the country to implement the Minimum Legal Size (MLS) for different fishes in the market in 2015 (Basheer, 2017). As per the law, the clams of shell size less than 20 mm cannot be sold in the domestic market, and this state law applies to Ashtamudi clams also. The fisheries department can inspect the landing centres and market and punish the fishing folks who violate the law by selling clams at sizes less than the MLS. The MLS regulation is a state law, which cannot be considered as a monitoring technique developed by the communities or VCFC. Interestingly, the MLS stated in the act is determined by CMFRI who also helps VCFC with strategies and recommendations for clam resource management.

Graduated punishments

The fifth design principle is the use of graduate sanctions by robust governance arrangements. It is meant for the violators of the established rules in a common pool resource. In many self-organized systems, the initial sanction imposed by a local monitor is small. Ostrom argues the initial sanction needs to be considered more as information to the person who is caught and to others in the community.

In Ashtamudi, the collective arrangements for governance could not come up with a graduated punishment system yet. VCFC has not been empowered enough to punish or take actions on legal grounds against any violators of the rules. However, the district collector who is also in charge of VCFC can take actions against the fishing folks who violate the executive orders. Although there were incidences reported by fisheries department on seizing of gears and clams collected during fishery holidays, such punitive actions cannot be identified with the graduated punishment system described by Ostrom. There is no written rule or punishment system for violators of rules in Ashtamudi.

Conflict resolution

The sixth principle refers to a conflict resolution mechanism, and it supports all the previous design principles. The rules and arrangement need to be understood properly by resource users; otherwise, it might lead to multiple interpretations. Many interpretations for norms set by communities can create conflicts, which reduce the trust level among resource users. However, simple mechanisms devised to get conflicts resolved immediately help to prevent the drop-in trust levels. The sixth design principle is significant as it points to the importance of accessing rapid and low-cost means to resolve conflicts among users, or between users and officials.

The number of conflicts reported among the fishing community in Ashtamudi is comparatively less. However, interviews with the fishing folks pointed at the existence of conflicts (not physical, but ideological) between the hand-pickers and dredgers, who resorted to two different technologies for engaging in clam collection. Hand-pickers in Ashtamudi have a lot of concerns with the scale at which the dredgers operate in the water. They believe that dredging is a destructive clam collection practice, as it churns the bottom of the lake and indiscriminately catches juveniles. On the other hand, the dredgers think that their mode of operation is vital for maintaining a healthy clam stock, as the traction effect of dredging make water more fertile through the mixing of nutrients.

There are no permanent mechanisms for resolving conflicts among the resource users in Ashtamudi. Since 2014, the conflicts or differences with resource users have been discussed at the quarterly meetings of VCFC. However, clam collectors do not prefer to wait for quarterly meetings of VCFC to discuss their conflicts and related issues. At present, such issues are resolved by VCFC members who live closer to the parties involved in a conflict.

Minimum Rights to organize

Principle 7 stipulates that any external government agencies do not challenge the right of local users to create their institutions (Cox, M., Arnold, and Tomás, 2010). This principle in a way advocates some level of autonomy for resource users in making decisions in compliance with their local context. Similarly, the design principle advocates against the imposition of any decisions by higher authority on resource users without taking them into confidence.

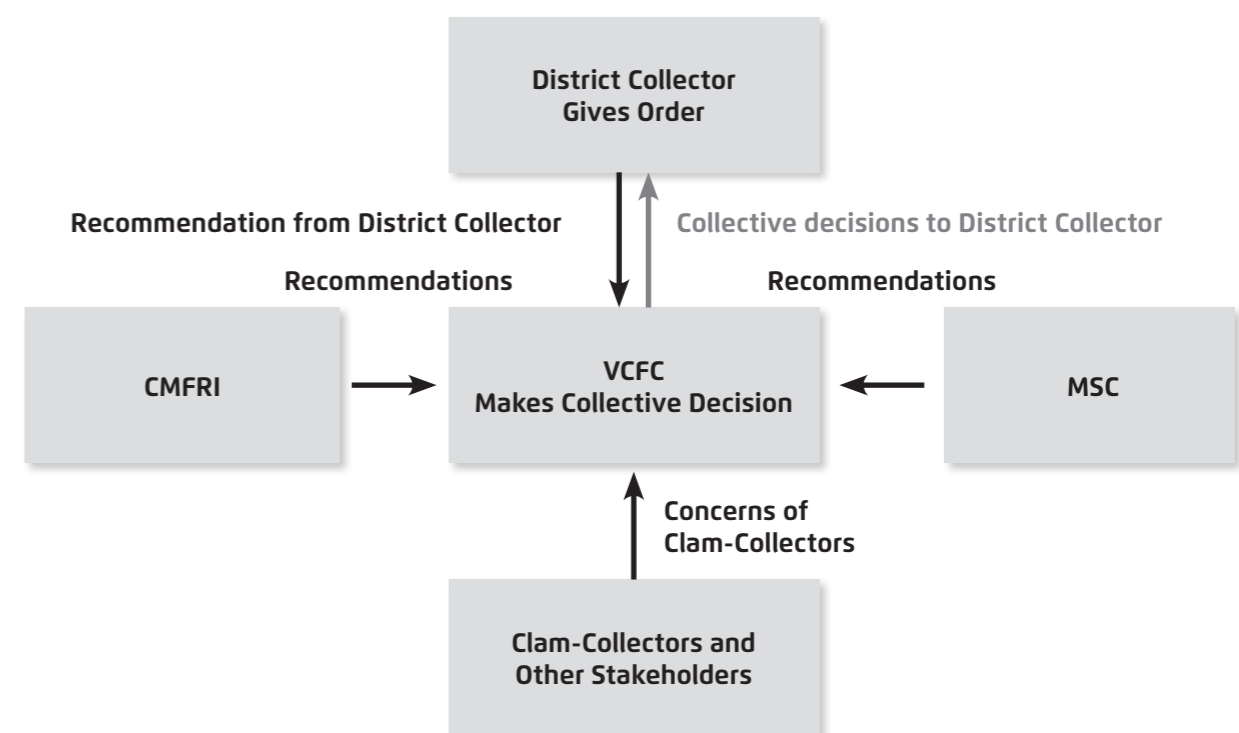


Fig 4: Operation of institutions in Ashtamudi

As mentioned earlier, the decision-making powers regarding the management of the fishery are vested with District Collector. However, all the members in VCFC have the right to voice their concerns during VCFC meetings. Through VCFC representatives, the clam collectors can also make District Collector aware of their concerns, even then, CMFRI as a scientific fisheries institution has more influence in the making of rules and plans for resource management. The dynamics of the stakeholders and their positions and contributions in the process of governance are illustrated in figure 3. From the illustration, it is evident that CMFRI is remaining as an external agency who influences the decisions through recommendations. Recently, MSC has also started acting as an external player in influencing the process of governance.

Nested enterprise principle

Ostrom developed the eighth and last design principle to characterize robust systems. Nested enterprise principle talks about governance activities in a resource system organized in multiple layers of nested institutions. In another way, long-enduring self-governed regimes and small-scale organizations tend to be nested in ever-larger organizations for better management (Ostrom, 2008). The design principle underlines that processes of appropriation, provision, monitoring, enforcement, conflict resolution, and government activities are organized in multiple layers of nested enterprises. Nesting may occur either between user groups and larger governmental jurisdictions, or between user groups themselves. Interactions that exist within communities are horizontal linkages, whereas those between resource users and governmental jurisdictions are vertical linkages (Cox, Arnold and Tomás, 2010).

The clam fisheries system in Ashtamudi is not very robust; it is relatively a homogenous fishery with small production. The Ashtamudi system, although smaller, is nested with other larger governance arrangements and laws concerning the fisheries higher in the hierarchy. VCFC, the central governing body, is a local institution and it is nested with the three-tier fisheries management system involving Gram Panchayat, District and the State level office of the Fisheries Department (Mohamed et al., 2013).

Ashtamudi three-tier VCFC experiment was first of its kind in natural resource management in Kerala. Following the three-tier fisheries management program in Ashtamudi, Kerala Marine Fisheries Regulation Act 1980 (KMFRA) has been amended. Section 13A (as inserted by state amendment, 2017) states that:

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“13A. Constitution of Fisheries Management Councils. (1) The Government may, for the effective management and surveillance of marine fisheries and for effectively carrying out the provisions of this Act, by notification in the Gazette, constitute a three-tier system of Fisheries Management Councils, namely:

- Fishing Village Management Council
- District Fisheries Management Council
- State Fisheries Management Council”

The proposed three-tier mechanism is applicable for whole marine fisheries resources across the state. The rule, hence, mandates the constitution of small fishery management councils at multiple levels, and VCFC can be identified as one such institution and it is nested in the larger legal instrument. The clam’s governance and management institutions are now vertically linked and nested in larger state jurisdictional systems, although several decisions and action plans are being made at the local level.

Natural Resource Governance Through Non-State Actors: Marine Stewardship Council (MSC) Certification

The extraordinary events in the epoch of neoliberalism and globalization of economics, finance, technology and institutions have influenced the way we perceive a wide range of issues. Globalization manifests and perceived differently across communities as well. The phenomenon as argued by Held and McGrew (2007), encapsulates multiple notions of social, cultural, economic and political lives. They argued that with globalization, action taken in one place can have an impact elsewhere. It compressed time and space, instant communication, and above all an increasing interdependence among us as societies and shrinking of the world, as countries appear to be much closer to each other tends towards a global integration.” (Gupta, 2004 and Held and McGrew, 2007).

The phenomenon of globalization had impacted the conventional power centres such as the nation states. It led to the emergence of non-state actors like Non-Governmental Organizations (NGOs) in the regimes of governance (Gupta, 2004). Following these shifts in power and increased interests in sustainable development and responsible utilization of finite resources available in the planet, non-state actors initiated a range of transnational certification programs for sustainable utilization and management of forests, fisheries and agricultural resources. The certification programs such as Forest Stewardship Council (FSC) were started for promoting sustainable utilization of the forest resources. This was a clear shift from the conventional nation-state government-dependent resource governance program. Such transnational certification programs were explained by several scholars as ‘private’ governance of natural resources (Kalfagianni & Pattberg, 2013).

According to Foley & McCay (2014):

“Philosophical foundations of and economic justifications for establishing governance through voluntary market mechanisms have been influenced by neo-liberal ideas and politics, which eschew mandatory state regulation and promote the use of the private sector over the public sector in ownership and in the provision of goods and services, including governance functions.”

What makes private governance ‘private’ is the kinds of rules they formulate and the way they operate as a governance regime. Private certifiers and their rules are never made after consulting with any nation-state rule-making institution such as parliament. The rules made by them are not accountable to any nation-state institution as well (Foley, 2014). Also, the private governance systems are not exerting any coercive forces to enforce their rules, but they use monetary incentives as the means to order the participants in the system. No air of coercion or force is required here as the participant has to comply with the standards and rules for a monetary incentive called premium price.

Origin of Marine Stewardship Council (MSC)

The collapse of the Grand Banks of Newfoundland cod fishery plateaus in the early 1990s created a lot of uncertainties and apprehensions for the resource users, mostly large corporations who depended on codfish for sustainability. The decline in the stock size of the cod fishery cuts short the availability of cheap seafood and the profit margin of the corporation (Fowler and Heap, 2000 and Foley, 2013). As a result, MSC was registered in the UK as an NGO and currently, the organization ranks as the world leader in marine wild-caught fisheries certification initiative (Foley and McCay, 2014 and Ponte, 2012). Michael Sutton, who was with World Wildlife Fund (WWF) said: “We must develop long-term solutions that are environmentally necessary and then, through economic incentives, make them politically feasible.” It shows the optimism that conservation groups had for finding alternatives in market force and monetary incentive.

The larger vision of the MSC initiative is to safeguard supplies of the seafood for present and the coming generation (Marine Stewardship Council, 2015). In that process, they are looking forward to complying with various fisheries across the globe regarding environmental sustainability standards and to help create sustainable managed resource systems. The sustainability standards of MSC are influenced by UN Food and Agriculture Organization’s (FAO) Code of Conduct for Responsible Fisheries (CCRF), the UN Fish Stocks Agreement and other international fisheries agreements. MSC is a certification program for the sustainable management of wild-caught fisheries in the world. They create sustainability standards on multiple aspects of a fishery to ensure its sustainability. MSC standards are categorized under three larger principles (Marine Stewardship Council, 2015).

The principles are given below:

1. Sustainable target fish stock-The principle says a fishery must be regulated against overfishing or depletion of the stock. The MSC standards under principle one, ensure an adequate level of

resource replenishment of the fisheries. The set of standards which come under this principle sustain the size of the resource, livelihoods opportunities and income for resource users.

2. The environmental impact of fishing- Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem. The regulations that are made as per the principle closely observe the interactions among species within the ecosystem. This principle directs users to develop strategies to bring back and sustain the balance of the ecosystem. The dependence of one species over the other, general equilibrium of ecosystem, the health of the ecosystem and species diversity are covered in the standards, which fall under this principle.
3. Effective Management- Fisheries should be subjected to an effective management system that respects local, national and international laws and standards. Such management units should be statutory and should have the capacity to make decisions for better governance of the resource.

The sustainability standards based on these principles were created after an extensive and very inclusive consultation process, involving more than 300 organizations and individuals, which include two experts drafting sessions and a series of international workshops across various regions in the world. These scientifically informed complex sustainability standards and their scale of operations qualifies MSC as the leader in global marine wild-caught fisheries certification (Guldbrandsen, 2009 and Marine Stewardship Council, 2015).

To start with the MSC certification, a fishery must apply for third-party assessments to know the status of their resource and assess it against MSC sustainability standards based on the above-mentioned principles. Fisheries that score a required minimum (60%) for the whole assessment and more than 80% for each principle are certified as “sustainably managed fishery” as per MSC standards. Nevertheless, in order to sell the certified products under the MSC eco-label for a premium price, a processor applies for MSC chain of custody standards and should be audited against these standards. This enables consumers to trace the movement of seafood from the point of production until it reaches their hands. The premium prices for eco-label are an incentive for the fishermen to conform to the sustainability standards of MSC. Currently, MSC certified wild-caught fishes of value over 4 billion USD are being traded in the international markets. By volume, it comes to an irreducibly significant 12% of the global seafood trade. (Marine Stewardship Council, 2015).

India’s First MSC Certified Fishery-Ashtamudi Yellow Clam fishery

In 2014, the Ashtamudi short-neck clam fishery became India’s first fishery certified as sustainable as per the MSC’s fisheries standards. The growing consumer demand for Ashtamudi yellow foot clam in the international market, the decade-long experience of clam collectors in collective resource management programs such as voluntary and temporal closure of the fishery for clam breeding and participatory management programs through newly evolved platform VCFC enabled the fishery to apply for certification program. The proposal for MSC certification were in talks since 2010. As a preliminary step, CMFRI scientists, with the funding support from WWF, started the pre-assessment

surveys for finding gaps in the fishery against sustainability standards set by MSC. Alongside the pre-survey, it was also intended to decide the potential of resource to be considered for certification and resource monitoring to know the status of the stock. A third-party firm audited the fishery in the pre-assessment stage and identified a few 'gaps' in the fishery which needs to be filled to get certified by the MSC. The 'gap' filling program is called the Fishery Improvement Program (FIP). The major gaps identified by Ashtamudi fisheries are the lack of management institutions to achieve a better score for MSC Principle 3. However, the annual closure of the fishery and the practice of fish stock assessments of CMFRI helped the fishery score better in first two principles of ecosystem and resource sustainability.

The filling up of 'gaps' was an important step in preparing the fishery for a full assessment and certified by MSC. To achieve this task, CMFRI came up with "The Clam Management Plan" for Ashtamudi in 2010. The document consisted of recommendations for improving the clam fishery in Ashtamudi. The document recommends the constitution of the Village Clam Fisheries Council (VCFC), originally a three-tier system for clam fisheries management in Ashtamudi. The recommendation was essentially creating a governing body for Ashtamudi which was lacking before. With the constitution of VCFC in 2013, the fishery could successfully fill the identified 'gaps' in management and could meet MSC standards under principle 3. Later the fishery applied for full certification with MSC.

In the full certification auditing process, MSC had concerns on certain ongoing local practices in Ashtamudi such as the opening of drainages directly into the lake by natives live on its banks. For full certification certifiers also demanded VCFC to fix a cap over Maximum Allowable Catch for a fisherman daily. The Fisheries Department officials convened a session with MSC officials and other stakeholders to address these concerns and introduce the idea of certification and its prospects to people. In the meeting, clam collectors agreed to the proposal of certifiers on phasing out the opening of the drainage to the lake; however, they opposed the proposal of fixing a cap over the resource (15kg./per day).

Further, a few more workshops with stakeholders were conducted to engage more with the community and build awareness on MSC certification. Finally, CMFRI initiated prolonged and expensive surveillance and stock analysis in Ashtamudi, which also helped the fishery to help get certified by the MSC. The certification auditing report by Intertek in 2014 states that:

"The fishery attained a score of 80 or more against each of the MSC principles and did not score less than 60 against any indicators. Intertek Fisheries Certification has concluded that the Ashtamudi Estuary Short Necked Clam Fishery (as defined in this report) should, therefore, be certified according to the Marine Stewardship Council." (Andrews and Appukuttan, 2014).

The fishery scored well in the assessments and got certified in 2014. The scores are given in the Table below.

Table 2: MSC scores

Final Principle Scores	
Principle	Score
Principle 1 - Target Species	85.4
Principle 2 - Ecosystem	85.3
Principle 3 - Management System	82.3

Table 2. MSC scores for Ashtamudi, (Andrews and Appukuttan, 2014)

The certification was done for two units of the fishery, which are the hand dredgers and free divers (Andrews and Appukuttan, 2014). President of Thekkumbhagam Panchayat received the certificate in November 2014 in the presence of officials from the fisheries department of Kerala Government and scientists from CMFRI. Currently, the district fisheries officer of Kollam holds the MSC certificate for Ashtamudi.

Through certification, MSC reiterated the fact that currently employed fishing methods, harvesting technologies, and clam stock size in Ashtamudi go well with their sustainability standards. With certification, the authorities can establish required institutions and facilities to determine traceability of the clam product from the production centres to the table in the value chain, which enables the traders to market the clams using MSC blue eco-label. Seafood Products with the blue MSC eco-label can be traded in the international markets at a premium price. It will work as a monetary incentive for clam collectors in continuing with the sustainability standards as proposed by MSC.

What do stakeholders in Ashtamudi think about MSC?

CMFRI and Fisheries Department, as two major stakeholders in the clam fisheries of Ashtamudi were interested in testing sustainability certification, which has never been experimented anywhere in the country.

The scientists and Fisheries Department introduced MSC in Ashtamudi, although it wasn't a demand from clam collectors. It was introduced as a development initiative to benefit clam collectors; economically. The spirit of certification is governance through incentives; however, many stakeholders thought of the program as a gateway to increase the income of clam collectors.

The Stakeholders of the fishery include clam collectors, scientists, officials and civil society actors. All of them had different perceptions of the certification of the resource. In the workshops and meetings held before certification, the clam collectors were sceptical of the program. A few officials had concerns on the potential appropriation of clam resource by MSC for their benefits.

MSC officials convinced them of the potential economic opportunities which the program can bring into clam collectors after its implementation in Ashtamudi. Further, the sponsors of the program, including the government officials promised the clam collectors that the price of clam would double after certification. The clam meat was being sold at Rs.100 per kg. when the promise was made. If the promise became a reality the clam collector would have earned Rs. 250 per kg. of the clam meat. However, even after certification, the meat is still being traded for a price range of Rs. 120-130 per kg.

The local Panchayat is also a key stockholder in local resource management. They are also part of VCFC. However, the village president who is an elected representative was less aware of certification and its impact in the local fishery and the economy. The current role of the Panchayat is just to help VCFC to gather data on clam collectors and other stakeholders for CMFRI and State fisheries department to develop management plans. The degree of participation by representatives of the panchayath in the process of decision making at VCFC is also not very significant. From the interviews, it could be inferred that even the Panchayat failed to identify themselves as a stakeholder in the process of certification and governance of the resource system. It is important to educate the leaders at the helm of panchayath administration about the power they could exercise and to take part actively in the clam resource governance.

Fishery scientists and Fisheries Department officials had a different perspective than the other stakeholders on the potential of certification. For them, MSC certification has the potential to contribute a lot more to the fishing industry in the country as a market-based resource management mechanism, as argued by fisheries scientists' officials will add more value to Indian seafood trade on a global level. By promoting fisheries certification standards, they claimed that the Indian seafood trading is joining the ongoing Global Sustainable Seafood movement. As a responsible major seafood trading nation in their opinion, Ashtamudi fisheries certification can be the first step to respect international commitments to codes like CCRF as MSC standards are created using FAO-CCRF³ (Muhammed, 2016).

Scientists also think that, MSC as an alternative for giving international exposure to the fishermen community. They believe that the benefits of certification are not only the economic incentives, but it is an opportunity for the fishermen community to develop their professionalism and competence, to face several challenges in a new globalized world where commodities are transported with fewer barriers. For them, a certification program augments the capacities of fishermen and give them an international exposure to sustainable seafood trade. Eventually, these factors contribute to creating a brand name for Indian seafood, internationally. The recently drafted National Policy on Marine Fisheries, 2017, also talks about improving India's share in certified products and it explicitly talks in favour of promoting eco-labelled products in the country.

³ FAO-CCRF (Code of Conduct for Responsible Fisheries) are voluntary guidelines drafted by FAO for promoting sustainable fishing across the globe. Many countries have adopted these guidelines as a standard to make fishing more sustainable.

Social Development Through Certification

MSC standards, lack social components such as community development and livelihood security (Foley, 2015). They are not accountable for the social development of the fishing community in Ashtamudi. However, VCFC with which MSC acts as a stakeholder is largely concerned about the social development of the fishing community. The fishery scientists and civil society members believe that the MSC standards at its current form can promote social development through income generation and sustainable livelihoods. They believe that the well-crafted sustainability principles of MSC help clam collectors to construct a new ecosystem, which ensures long-term availability of clams for trade. For scientists a healthy ecosystem with adequate stock size helps the fishermen to sustain their livelihoods and create more livelihood opportunities.

MSC and Management of Clam Stock

The fisheries management in multi-species, tropical waters are an extremely challenging affair (Pauly, 1979). The diversity of the species combining the reduced selectivity of gears⁴ is posing a threat to the stock of fisheries resources in tropical waters. Conventionally, fisheries scientists propose a reduction in mesh sizes or temporal closure of fishery as the means to manage the size of the stock. Although these measures have been in practice for decades, most tropical fisheries, in general, are being threatened by overexploitation.

Fishery scientists in CMFRI who are trained in fishery biology uses fishery bio-economic models to determine the resource management strategies for marine capture fisheries in India. The bioeconomic model-based management examines the stock size and determines a production number available to catch using scientific methods. Currently, a few fisheries scientists think that the use of market forces has the potential to manage and sustain the resources by altering consumer behaviour through initiatives like MSC. Fishery scientists are exploring the capabilities of market-based fisheries certification schemes in impacting resource management positively. Moreover, they think it helps in solving the current resource management complexities with the multispecies tropical fisheries. For them, MSC employs a very coherent scheme of resource management standards, also they are informed by science and varied international fishery codes of conduct.

Marine Stewardship Council: A Success in Ashtamudi?

“Ashtamudi Stories” published on the official website of MSC celebrates the certification in Ashtamudi as a highly successful intervention (Ashtamudi stories, 2016). As per MSC website, the clam fishery in Ashtamudi is regarded as “fairly good and sustainable” by a third-party auditor. The website report says the “Clams from Ashtamudi are being sold with blue MSC eco-label” which is creating unparalleled opportunities for small scale collectors here. The website accentuates the

⁴ Most fishing gears, for example, trawl gears, are selective for the larger sizes, while some gears (gill nets) are selective for a certain length range only, thus excluding the capture of very small and very large fish. This property of fishing gear is called “gear selectivity”. See <http://www.fao.org/docrep/w5449e/w5449e08.htm>

certification as a 'success' and how MSC can work for the benefits of small-scale fisheries which hardly get any attention from administrators. The MSC 2015 reports stated that the fishermen are hopeful about MSC and it will help them to enter high-value markets in Europe and the US, where MSC certified products are increasingly sought after. The stories of 'success' around MSC are predominantly heard from the stakeholders like the state department and scientific community who hailed the initiative as a gateway of prosperity for clam collectors. In this regard, it is imperative to investigate the thoughts of the fishing folks who are expected to be the final beneficiaries of the program.

The first set of interviews that I conducted with the fishermen who attended MSC workshops gave a very distinctive picture different from the "success stories" published in the website. A middleman whom I interviewed portrayed a very rosy picture about MSC in Ashtamudi. He emphasized the program will improve the income of clam collectors and conservation of the resource. A few clam collectors have thought an increased income through market incentives help them to allocate more money to meet their additional expenses like health, constructing new houses and education of their children. They saw some potential with MSC in changing the current labour- middlemen personal equation which always worked in favour of the latter.

Considering these diverse views and understanding of stakeholders, I am trying to understand the degree of 'success' of certification in fulfilling the above-mentioned aspirations of people. For that, I will be looking into the aspects like the number of clams landed each year, improvements in the product standards and the price of clam after certification, changes like institution and perceptions of people about MSC as a governance mechanism.

The volume of Clam production after MSC

It is important to critically analyse whether VCFC and certification have any influence over the total volume of production of the clam each year in Ashtamudi. CMFRI annual stock assessment data are the only available document on the total output of the resource over the past few years. The figure, which is given below, is produced by CMFRI after consolidating out of the stock assessment data collected by representing the total landing of clam in a year and the Catch Per Unit Effort (CPUE), which is defined as the amount of clams collected by each boat in kilograms for one day of their operation.

From the assessment, it is apparent that the output of the fishery has been very steady since 2009. Nevertheless, the quantity of total landing came down from peak 15000 t in 2005 to less than 10000 t after 2009. The CPUE values also came down after the sharp decline of the total landing in 2002. It implies that the total output from the fishery has not improved a lot in output or CPUE value since VCFC came to existence in 2013 and certification followed in 2014. Post VCFC and certification years, a slight dip in the total output and CPUE in 2016 are seen. In a nutshell, the fishery is generally performing very steadily since 2010 where output is hovering under 10000 t. An increasing output is not the trend even after certification and the institution of VCFC.

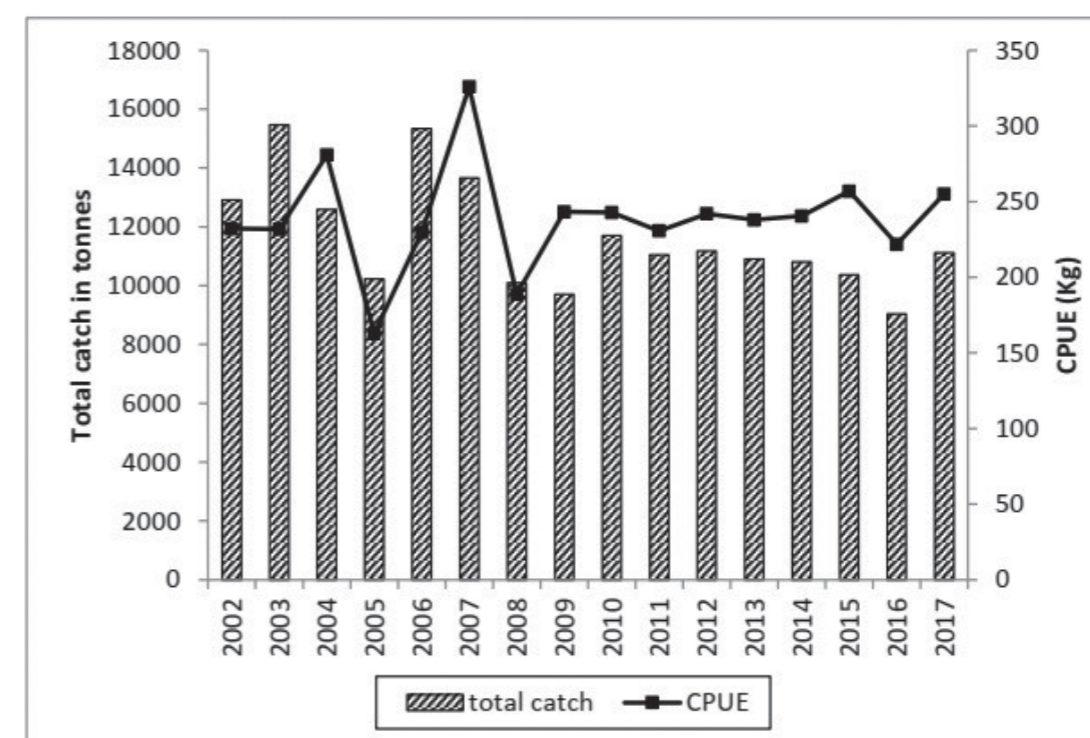


Fig 5: Taken from CMFRI Ashtamudi Clam Survey Report 2017 (Unpublished)

Standards and prices of products after MSC

Improved price for the clam was the first promise of authorities to clam collectors. In 2019, while the fishery completed the fifth year of certification the current clam price is not matching with the promised price. In the first year of certification, the clam price was at Rs 75-90 per kg. However, certification, promised Rs. 200 per kg. of meat for clam collectors in 2014. In the fifth year of certification, the price could only reach in the range of Rs. 120-130 per kg. which is lower than the promised price.

The certification couldn't bring a huge difference in the margin of the price. Ironically, it became a reason for agents to stop providing an annual bonus for the fishermen. The agents denied bonus for some clam collectors claiming that the bonus is an insignificant practice as income of clam collectors improve with certification. In short, certification never contributed much to the improvement of income of clam collectors, instead, it became a rationale for agents to stop the additional income that clam collectors were getting till certification. In addition to this counterproductive experience, a group of clam collectors even took MSC as a scam as it only benefits exporters and agents who directly dealt with export and trade.

Clam collectors are not sure about new initiatives to improve the clam processing infrastructure and they are less aware of eco-labels for improving export. In this regard, the fishery needed a fresh start for improving awareness of clam collectors on certification to establishing traceability or 'chain of custody' (MSC, 2012) for promoting export to claim premium price as promised to the

collectors. Lack of awareness about the idea of certification acted as a bottleneck for clam collectors to claim premium prices or sell their products for market incentives.

In between institutions like Marine Products Export Development Authority (MPEDA), a central government agency in promoting seafood export showed some interest in helping clam collectors and clam processors to establish traceability for Ashtamudi clams, thereby tapping the growing consumer demand of certified products across the globe. As a result, three fish processing companies recently applied and certified with 'chain of custody' and rights for using MSC ecolabels for Ashtamudi clams. A group of clam collectors (15 boats) has started supplying clams for one processor as well. However, they are supplying the clams at a lower price than the market price for a processor with the hope of getting the premium price sometime in the future.

Changes in institutions and perceptions of people with certification

Many clam collectors couldn't sense any drastic changes in the process of production, quality of the product and methods of marketing to differentiate their experiences before and after certification. They couldn't also sense any evident changes in the way institution functions and the governance works. For many clam collectors, MSC certification is an international award, a document of recognition that must be preserved or framed. For another group of clam collectors, MSC has been just another welfare scheme introduced by the government to help support the fishermen to tide over various issues.

MSC as a governance mechanism

MSC hasn't changed any of the existing governance mechanisms which were already in practice in Ashtamudi. Instead, MSC blended its sustainability standards with existing practices without suggesting any major changes in the way the fishery operated. The major governance decisions regarding clams are still being taken through state government and Fisheries Department. Despite the certification of the resource, the clam collectors never recognised MSC as a prominent governing institution. Because they don't see any MSC development on the ground like market incentives or anything.

Discussions

The prime focus and objectives of the study were to learn and document the history of unique clam resource governance practices of Ashtamudi. Distributed across the saline waters of the estuarine bar mouth of Ashtamudi Lake, yellow foot or Ashtamudi clam resource is a crucial aquatic resource supporting the livelihoods of over three thousand people in Ashtamudi region. The fishery collapsed in the early late 80s or early 90s owing to increased export market demand. The social organization and governance arrangements which evolved as a response to this crisis in Ashtamudi with the support of the state institutions offered us an interesting case to investigate, research and document.

The period of the crisis was a critical juncture in the history of clam resource-based supported the local economy. The crisis changed the perspective and attitudes of people on the clam resources; they became more aware of the stock management measures for the restoration of the resource stock and hence secure their livelihoods.

They took up the resource management a matter of concern and were able to implement a few management programs with the support of the government, scientists and experts through a clam collector collective. In the subsequent years the collective got disintegrated owing to increased politicization of the organisation, yet clam collectors took a special interest in continuing with the post-crisis management strategies for scientific fisheries management like temporal closure of the fishery, regulations for mesh size of the net size.

For a systematic understanding of the characteristics of the resource post-crisis period, I used eight design principles formulated by Ostrom (2008) for the study of the commons. My intention was not to force-fit the clam resource system in the framework after identifying it as a CPR as described by Ostrom. Many of the institutions and governance arrangements which are suggested in the design principles framework is not existing in Ashtamudi. The purpose of the use of the framework was to question the 'existence of governance' in Ashtamudi.

Defining and demarcating boundaries of the resource system are a major challenge in Ashtamudi owing to multiple reasons like dynamics in salinity and spatial distribution of the clams in the water. To define the boundaries, the VCFC and other stakeholders should find inclusive and novel ways like participatory decision-making process for defining boundaries by accommodating all the complexities within the system. The zones which are marked and used by CMFRI can be identified as a starting point to start developing boundaries for the resource system.

It would have been great if more local fishermen with CMFRI, while they define the boundaries as the inputs from local clam collectors will make the boundaries more realistic and relevant for local realities. A more participatory way of defining boundaries through discussion will help the clam collectors to relate to the act of governance and their sense of ownership of the resource. The proposed plans to issue ID cards can be implemented efficiently and can work as a relevant tool to exclude other fishermen if the boundary is well demarcated.

The resource system lacks any resource appropriation and provisioning rules, or agreements defined by the second design principle. Although CMFRI assesses the quantity of the harvestable amount of clam for every year in terms of MSY, the scope of this exercise never extended to discussions around the claim of each active clam collector over it. More participatory and preliminary discussions around the stake of everyone in the stock will make people aware of the system and will influence their behaviour towards the act of governance. No provisions for setting graduated punishments are existing in the system and it's not clear whether such codes are required in Ashtamudi, as several complaints reported on the illegal clam collection are very poor. Nonetheless, to make it organized and ensure collective resource management, a consensus of both hand dredgers and

hand pickers should be developed. For that, the currently active groupings like VCFC should step in and ensure close engagements for facilitating democratic discussions among both parties. Such attempts will help build trust among both groups of clam collectors.

A formal collective choice-making arrangement as specified in the third principle has not been in existence. However, the inception of VCFC in 2013 opened the new possibilities which can potentially be evolved into a collective choice-making body for the governance of clams in Ashtamudi. This institution is still identified as an informal committee, constituted for fulfilling the requirements for principle 3 of MSC on management and governance. However, the chairmanship of DC implicitly influenced clam collectors and made them accept VCFC as a legitimate grouping for resource management.

As a collective decision-making body, VCFC has immense potential to evolve into an institution offering a democratic platform for all stakeholders. Nonetheless, it requires structural reforms to widen its scope and relevance in clam resource management. Primarily, the institution needs a constitution, which defines its operation, vision, objectives and a well-defined democratic means to reach consensus in the process of decision making. Currently, the body is working as a vehicle to implement orders, recommendations and decisions of the Fisheries Department and CMFRI. In that sense, VCFC is not a collective choice-making institution in true sense.

To make the institution the real 'collective', certain approaches are needed, which include the promotion of bottom-up decision making along with current top-down ways of implementing a decision. Periodic reconstitution of the VCFC governing body is also important to ensure the participation of all clam collectors in the decision-making process. For that, a rotation-based selection system to help reduce the chances for an individual in exercising a disproportionate amount of power and influence over decision making in VCFC.

In the current context, VCFC lacks a dedicated committee to resolve the conflicts among clam collectors, hence, for conflict resolution, the clam collectors often go to individual VCFC members to solve issues. To make the process a little more organized and transparent, VCFC should evolve and maintain a committee of selected members who are empowered to convene a session anytime at the request of clam collectors for resolving serious conflicts among clam collectors.

Similarly, the existence of governance arrangements or institutions for community-based resource monitoring (principle 4) and conflict resolution (principle 6) is not evident in Ashtamudi. Absence of these institutions puts Ashtamudi clam resource in the league of open access resource regime, which is highly susceptible to unsustainable extraction and can end up in a collapse of the system. Along with resource monitoring which has been conducted during the annual closure of the fishery, the VCFC and other stakeholders should initiate interventions to manage the fishery throughout the year. The recent proposal of VCFC for issuing identity cards for all clam collectors is a major step towards it, nonetheless, more effort is required to implement the management strategies efficient and acquire legitimacy for the system.

VCFC is a possibility to enlarge the field of governance to participatory, democratic and bottom up. It should concern about livelihood and income security of the fishing community which are not the priority of certification. It must be used to channelize the spirit of the clam collectors for conservation for a common good which they showed in the early 90s.

Fishery managers are very vocal about the achievements of clam collectors in stabilizing the stock through their collective efforts and management practices like temporal closure of the fishery. Some scholars even referred Ashtamudi model a successful fishery co-management¹ program in the country. This steady and consistent resource management program prompted authorities to apply for the MSC sustainability certification program for more monetary incentives and capturing the market. Scientists in CMFRI identified the market incentive based MSC system as the best way to manage the complex multi-species tropical resource 'sustainably'.

The proposal to prepare Ashtamudi ecosystem in compliance with the MSC standards was initiated with the CMFRI's Ashtamudi Clam Management Plans which suggested the establishment of VCFC to meet principles of management. The fishery got certified "Sustainable" as per the standards of MSC in 2014. Currently, the fishery completed five years of certification. It is looking forward to getting re-certified to maintain the current status for another five more years. Historically, the fisheries management process in Ashtamudi waters has been carried out by consulting resource users and experts. The implementation of the decisions after consultation is top-down. However, MSC certification was given directly to resource users without having any consultation with them. Nonetheless the promoters of the certification program set up a meeting with a few resource users and MSC officials to address their concerns and doubts about the program.

Authorities are expected to formulate a radical shift in the process of governance of resource through certification and the institutions which they poised to build. However, the promoters of the program couldn't reach out to all the clam collectors as there wasn't any consultation process planned before initiating the program. Most of the people, especially the aged clam collectors have no clue about the role of the MSC in the governance. Many of them still understood MSC as an international award granted to the Fisheries Department for acknowledging the valiant efforts of the community in sustaining the resource through means of management like temporal closure of fisheries. Some of them even recognized MSC as a means to improve the income of the fishing community and some fishermen identified it as a welfare program as the certificate is held by the Fisheries Department.

Although, MSC has been conceived originally as an alternative fisheries governance model using market incentives, the perceptions of scientists and the State officials who coordinated the certification program identified the program as a means of correcting the flaws in fisheries resource management in India, improving income, instilling professionalism among the fishing community and promoting international branding of Indian seafood. Even though the stakeholders have multiple perceptions about MSC, the certification couldn't produce any tangible results in

either increasing income of the fishing folds or branding of the product for export which confused the stakeholders about the real beneficiaries of the program. There are multiple reasons which restrict clam collectors from economic incentives. A major reason is a lack of follow up for more exporting companies having 'chain of custody' rights to procure clams.

It has been reported that three processing companies got these rights and one player started procuring the product from clam collectors. Nonetheless, the benefits of such program haven't trickled down to clam collectors. This could be an issue with a governance structure which needs to be fixed after discussions and consultations. The market dynamics and volatilities also matter a lot in the context, as the clams are getting a much better price in the domestic market than the international markets. So, the preferences of the producer may change with trends in the market.

At this juncture, it is important to differentiate and closely study the governance program in Ashtamudi. MSC is unknown to most clam fisheries stakeholder in Ashtamudi, however, VCFC which was instituted for achieving the certification is the centre of all governance initiatives in Ashtamudi. MSC is just as a certification regime, however, it remains unused. Yet the program can be used as an opportunity to garner more income for clam collectors in the future if rights steps in the right directions are taken. As a multi-stakeholder body VCFC is also instrumental in fulfilling the promises to people using the opportunities which are offered by MSC. This is because VCFC is an active grouping who are concerned about resource conservation, livelihoods and income security of clam collectors while the MSC is just a sustainability standard; a reference for creating an ecosystem with a healthy stock of the targeted species.

Clam collectors can achieve premium prices and other ambitious targets only if VCFC take active initiatives through inclusive and participatory governance initiatives and create awareness among clam collectors about the whole governance system. The deficit in trust between different stakeholders can also be resolved through active involvement of VCFC with clam collectors. Hopefully, the recent initiatives like the establishment of a clam collectors' co-operative society may contribute towards increased participation and awareness of stakeholders on the resource management and markets. The clam fishery is still being managed and governed through the institutions, norms and practices which I have identified using the Ostrom's framework. Although the objective of VCFC was inclusive fisheries governance, many fishing folks lack power and representation in VCFC to negotiate and discuss the resource management and income improvement program. To unleash the power and possibilities of participatory and inclusive governance, VCFC should actively pursue the ways to reform. It demands research and consultation to know how we can set the path for reform. A research program focused on identifying the possibilities for the institutional reforms of VCFC and developing collaborations with industry, the State and National institutions are worth exploring. It is the time to introspect and rethink the system through another Clam Management Plan.

Conclusion

The study emphasizes the experiences of communities with the unique forms of clam resource governance in Ashtamudi. More specifically, the study was investigating the stakeholder relationships; governance structures and the characteristics of the resource system over two decades. It is presented as a brief history of clam fisheries governance, which unveils the spectrum of socio-cultural- economic-political lives of communities and the nature of resource in Ashtamudi. The Ashtamudi clam fisheries can be characterized as relatively small-sized fishery with immense economic importance as a commodity for export which operates at a homogenous scale using fewer intensive technologies. These characters helped fishery to develop its ways of doing governance after evolving unique stakeholder relationships. The fishery shared the characters of both participatory and community-based fisheries management program through institutions like VCFC and top-down governance through the influential Fisheries Department. MSC certification is an extension to the ongoing experiments with governance in Ashtamudi.

A detailed analysis of perceptions of stakeholders contradicts the success stories of the MSC experiment as portrayed in the media. Despite its ambitious promises, including economic benefits, the experiment could not reach many in the fishing community and capture their imaginations. The reasons could be the failure of the program to account local realities, political dynamics and norms in Ashtamudi. Beyond the attractive monetary incentives, the authorities couldn't do much to convince people on the operations side of MSC which inadvertently and negatively impacted the perceptions of clam collectors to align with the vision put forth by the authorities.

In a rapidly globalizing world, the characters and preferences of the market are undergoing a drastic change. New governance experiments like MSC can reimagine the ways of resource management with changing norms and needs of the time. The failures of MSC in taking off and achieving the proposed goals in Ashtamudi call for a closer look at the current institutions and its capacities. It calls for more research to rethink the ways these new governance systems of global scale work in each context. The learning and takeaways from Ashtamudi could be useful for meticulous planning and proper execution of upcoming MSC certification programs for 10 potential fisheries ("FNB News - 10 fisheries from India bag eco-labelling certification from MSC, London | FNB News", 2018) identified by the authorities. Such upcoming programs, putting forth the scope of studies to know the experiences of different fisheries having distinct socio-ecological and cultural characters work in a larger framework like MSC. Such inputs are invaluable to envisage policies and plans which are working towards more sustainable and inclusive ways of development.

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