

Pattivalai: Traditional Shore Fish-Trap Fishing, Livelihood Contribution and Ecological Significance in The Mandapam Region, Tamil Nadu, India

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Abstract

Pattivalai (shore fish trap), locally known as Kalangatti Valai, is a traditional shore fish trap practiced by the fishing communities of the Mandapam region along the Gulf of Mannar and Palk Bay, Tamil Nadu. Despite its distinctive construction, seasonal operation and livelihood significance, contemporary information on this traditional fishing system remains limited. The present study documents the traditional knowledge, construction, installation, operation, maintenance, harvesting practices, catch composition and economic contribution of Pattivalai fishing. The study recorded the use of fixed shore-associated structures comprising guiding wall nets and retaining enclosures, including the Perunguda and Siruguda. Fishing and harvesting were generally completed within approximately 2 h, after which fishermen could sell the catch and engage in other livelihood activities, demonstrating the role of Pattivalai as an additional source of income. The mean daily catch was 15.0 kg, with *Loligo* sp. contributing the highest proportion (26%), followed by *Siganus* sp. (18%) and *Sphyrna* sp. (12.67%). The total expenditure for construction and installation was approximately ₹1,28,500. Periodic net replacement, locally referred to as Valaipachal, was undertaken approximately once a month or once in two months depending on fouling conditions and required about 5 h. The study also documented seasonal adaptation of the fishery between the Gulf of Mannar and Palk Bay in response to sea conditions. As a passive, shore-associated fishing method, Pattivalai harvests fish through their natural movement into the fixed trap, with comparatively limited active fishing effort. The findings demonstrate that Pattivalai is not merely a fishing gear but a living traditional knowledge system that integrates fishing, environmental adaptation, skilled construction and supplementary livelihood generation. Documenting and strengthening such traditional practices, alongside appropriate ecological assessment, can contribute to the preservation of fishing heritage and the promotion of sustainable use and conservation of nearshore marine resources.

Keywords: Pattivalai (shore fish trap), traditional fishing, Palk Bay, Gulf of Mannar, small-scale fisheries, livelihood, sustainable fisheries.

Introduction

Pattivalai (shore fish trap) is a traditional fishing method originating from the Sri Lankan Tamil fishing community. Sri Lankan Tamil people residing in Mandapam, Tamil Nadu, introduced and established this distinctive fishing method in the coastal waters of the Gulf of Mannar and Palk Bay (Venkatesan, 2010). The traditional fishing gear currently known as Pattivalai (shore fish trap) is locally referred to as Kalangatti Valai. Based on the local terminology documented during the present study, kalan refers to shallow water, katti refers to tying or fixing, and valai refers to a fishing net. Thus, Kalangatti Valai describes a fishing net that is tied or fixed in shallow waters. In the Mandapam region, this traditional gear is commonly known as Pattivalai. The gear represents a distinctive form of traditional nearshore fishing in which the fishing structure is fixed at a selected shallow-water site and functions by intercepting fish moving through the coastal waters. The method reflects locally developed knowledge of coastal fishing conditions, including the selection of suitable fishing grounds, construction and placement of the fishing structure, seasonal operation, harvesting, and maintenance.

The current study was conducted in the Mandapam region of Tamil Nadu, southeastern India, encompassing the adjacent coastal waters of Palk Bay and the Gulf of Mannar. The region supports diverse traditional fishing activities and is characterized by shallow coastal waters that provide favourable conditions for shore-based and nearshore fishing practices. Mandapam was selected as the principal study area because Pattivalai construction, installation, maintenance, and fishing operations are traditionally undertaken by the local Sri Lankan Tamil fishing community residing in the area. The Pattivalai fishing practice in the surrounding coastal region is not restricted to individual fishing operations. The structures are constructed both for the fishers' own fishing activities and on a contractual basis for other fishermen, providing an additional livelihood opportunity for those engaged in their construction and installation. Although Pattivalai is fixed at a particular fishing site during operation, it is not permanently maintained at the same location throughout the year. Its location is adjusted according to prevailing sea conditions, with fishermen relocating the structure between suitable coastal areas when required. Currently,

Pattivalai is operated along the Gulf of Mannar coast between Rameswaram and Ervadi and along the Palk Bay coast between Rameswaram and Alagankulam.

The present study aims to provide a comprehensive contemporary assessment of the traditional Pattivalai fishery in the Mandapam region of Tamil Nadu. The study documents the traditional knowledge and practices underlying the construction, installation, seasonal relocation, maintenance, and operation of Pattivalai in the Gulf of Mannar and Palk Bay. It further examines the harvesting techniques employed by fishermen, the composition and quantity of the catch, and the economic returns associated with the fishery. By integrating the technical, ecological, and socioeconomic aspects of Pattivalai fishing, the study seeks to document the knowledge system associated with this distinctive traditional fishing practice and assess its continuing role in the livelihoods of the fishing community. Such documentation is important for understanding the persistence and adaptation of traditional fishing practices under changing coastal and socioeconomic conditions and for providing a baseline for their future conservation and sustainable management.

Materials and Methods

Construction and installation of Pattivalai

The construction and installation of Pattivalai were documented through direct field observations and discussions with fishermen engaged in this traditional fishing practice. Pattivalai was constructed using wooden or iron poles as supporting structures, with fishing netting forming the principal enclosure. Approximately 50 wooden or iron poles were used to construct and secure each Pattivalai, while approximately 40 kg of fishing net was required to complete the enclosure. The poles were positioned in the intertidal and shallow coastal zones based on local fishing knowledge and prevailing site conditions. The netting was subsequently attached and securely fastened to the supporting poles to form the fishing enclosure.

Fish harvesting from Pattivalai

Fish retained within the Pattivalai enclosure were harvested manually using a locally designed dragnet is called Kadipu. The dragnet consisted of two wooden poles and approximately 3-4 m of fishing net, with the net length adjusted according to the size of the Pattivalai enclosure. Small sinkers were attached continuously along the lower edge of the net to maintain contact with the bottom, while floaters were fixed along the upper edge to keep the netting vertically suspended in the water column. During harvesting, the dragnet was manually operated within the Pattivalai enclosure to collect the accumulated fish.

Equipment used for Pattivalai construction, installation and harvesting

Traditional and locally adapted equipment was used for the construction, installation, and harvesting operations of Pattivalai. Inflatable tyre tubes were used as flotation devices, providing buoyancy and allowing fishermen to sit or move within the water while constructing and maintaining the fishing structure. The tyre tubes were also used to support and carry the dragnet (Kadippu) during harvesting operations. Aluminium plates were locally adapted and used as hand-made fins to facilitate movement through the water. Snorkels were used to assist fishermen during underwater activities associated with the installation, inspection, and maintenance of the Pattivalai structure.

Study area

The present study was conducted in the Mandapam region of Tamil Nadu, southeastern India, encompassing the adjacent coastal waters of the Palk Bay and Gulf of Mannar. The region supports a range of traditional fishing practices and is characterized by shallow coastal waters that provide suitable conditions for shore-based and nearshore fishing activities. Mandapam was selected as the principal study area because the construction, installation, maintenance, and operation of Pattivalai are traditionally undertaken by the local Sri Lankan Tamil people fishing community residing in the area (Mandapam camp). The Pattivalai used in the surrounding coastal region are constructed both for individual fishing operations and on a contractual basis for other fishermen. Based on field information obtained from local fishermen, approximately 40 Pattivalai are operated along the Gulf of Mannar coast between Rameswaram and Ervadi, while approximately 30 Pattivalai are distributed along the Palk Bay coast between Rameswaram and Alagankulam. These figures represent locally reported estimates of the distribution of Pattivalai in the region (Figure 1.).

Field survey

Field observations were conducted in the Mandapam region to document the traditional knowledge and fishing practices associated with Pattivalai. The survey involved direct participation in fishing operations with experienced fishermen and systematic observation of Pattivalai construction, installation, maintenance, and fish-harvesting procedures. Particular attention was given to the arrangement of supporting poles and netting, methods used to maintain the structure, operation of the dragnet during harvesting, and the handling and collection of the catch. Information obtained through direct observations and interactions with fishermen was supplemented by questionnaire-based interviews to document fishing practices, catch characteristics, fishing frequency, and other aspects of the Pattivalai fishery.

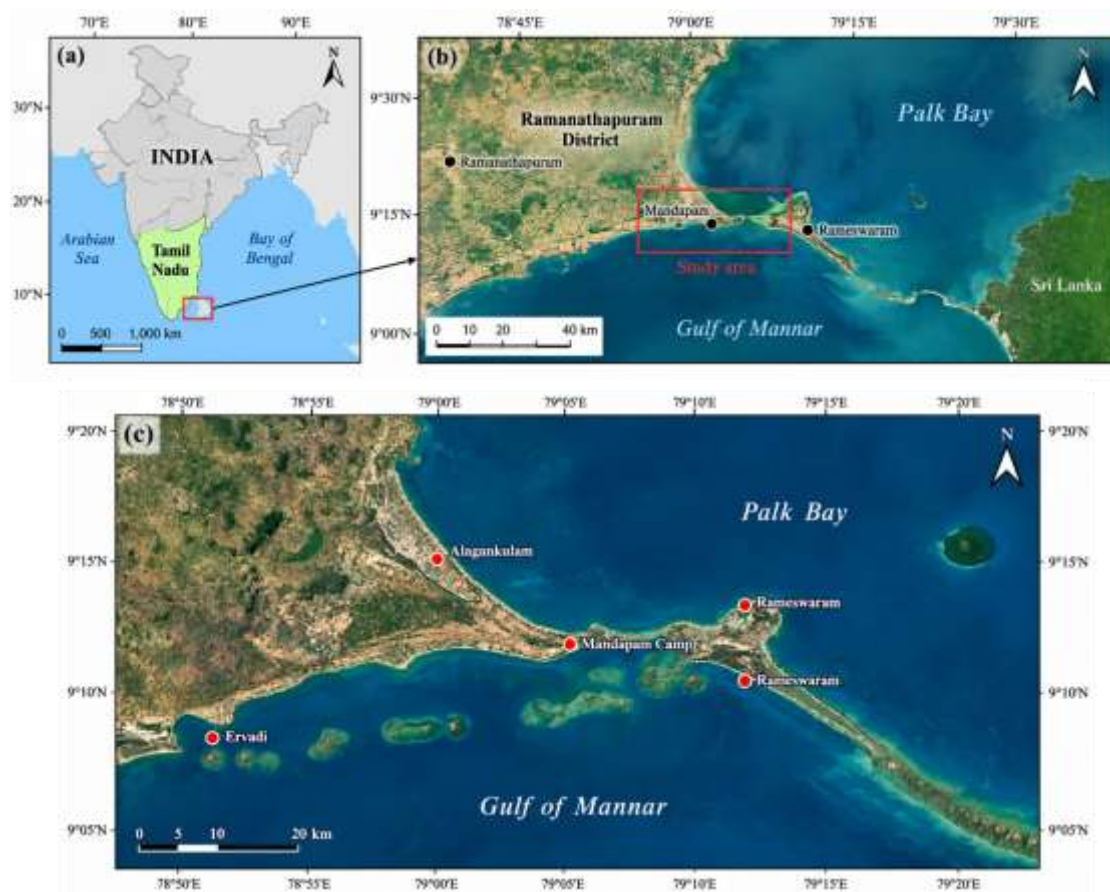


Figure 1. Study area map showing the location of the pattivalai (a) India with Tamil Nadu highlighted, (b) Ramanathapuram coast showing the study area, and (c) Detailed map of pattivalai fishing locations in the Gulf of Mannar (Rameswaram to Ervadi) and Palk Bay (Rameswaram to Alagankulam).

Result

Fishing Practice

Pattivalai, a traditional trap-fishing method of Sri Lankan-origin communities settled in Mandapam Camp, Tamil Nadu, was recorded in both the Gulf of Mannar and Palk Bay, with distinct seasonal patterns of operation. In the Gulf of Mannar, the fishery operated primarily from October to March, whereas in Palk Bay it was conducted from April to September, corresponding to the calmer sea conditions on each respective coast. In both regions, the operational period was not strictly calendrical but was modulated by prevailing sea conditions: structures were typically dismantled 1–2 months earlier under rough sea conditions and could be extended by a similar duration when conditions remained favourable.

The catch data obtained from 15 Pattivalai practitioners indicated considerable variation in daily catch. The reported minimum catch was consistently 0 kg day⁻¹, whereas the reported maximum catch ranged from 52 to 62 kg day⁻¹, with an overall mean maximum catch of approximately 59.4 kg day⁻¹. The reported average daily catch ranged from 12 to 18 kg day⁻¹, with an overall mean of approximately 15.3 kg day⁻¹, supporting an estimated typical catch rate of about 15 kg day⁻¹. The highest reported average catch was 18 kg day⁻¹, while the

lowest was 12 kg day⁻¹. These variations indicate that catch yields were strongly influenced by local fishing conditions and the availability and movement of target species.

Harvesting Method: Fish harvesting from Pattivalai was mainly carried out inside the Siruguda (inner retention enclosure) by two fishermen using snorkelling masks and aluminium plates to collect the fish. Depending on the fishing conditions and individual practices, fishermen accessed the Siruguda by swimming from the shore, using inflated tyre tubes, or by boat. A drag net locally known as Kadipu was also used for harvesting. During Kadipu operation, one fisherman remained near the entrance of the Siruguda holding one end of the net, while the second fisherman dragged the net in a circular direction inside the Siruguda to concentrate the fish. The second fisherman then returned towards the entrance, where both ends of the Kadipu were brought together and the net was folded to concentrate and retain the catch. The harvested fish were subsequently transported back to the boat or shore.

The Pattivalai catch was dominated by *Siganus* sp., *Sphyræna* sp., and *Loligo* sp., reflecting the passive, current-dependent interception mechanism of the fixed structure. Fishing activity was relatively intensive among the practitioners, with reported fishing days ranging from 24 to 28 days per month, averaging approximately 24.9 days month⁻¹. Correspondingly, daily income ranged widely from ₹0 to ₹6,000, reflecting variability in catch quantity and species composition. Beyond direct fishing returns, Pattivalai supported a secondary livelihood stream: experienced practitioners constructed and installed structures for fishers of neighbouring villages on a fee basis, extending the socioeconomic value of the practice beyond individual catch income (Table 1).

Table 1. Minimum, maximum, and average daily catch reported by Pattivalai fishermen from Mandapam Camp.

Pattivalai No.	Reported min catch(kg/day)	Reported max catch(kg/day)	Average reported catch(kg/day)	Fishing day/ months
1	0	52	16	28
2	0	60	15	25
3	0	60	18	24
4	0	55	15	25
5	0	58	15	24
6	0	62	15	24
7	0	60	15	24
8	0	55	18	24
9	0	55	12	24
10	0	60	12	24
11	0	58	15	24
12	0	60	15	24
13	0	60	15	25
14	0	62	15	24
15	0	60	15	24

Construction and Installation of pattivalai

The construction of Pattivalai followed a sequential process involving the formation of a large enclosure (Main Holding Enclosure), an inner small enclosure (Inner Retention Enclosure), connecting openings, and guiding net walls. First, the main holding enclosure, locally referred to as the “Perunguda,” was constructed and fixed in the fishing ground. Within the Perunguda, inner retention enclosure, locally known as the “Siruguda,” was subsequently constructed. A small opening or entrance was then created between the Perunguda and Siruguda to allow fish to move from the larger enclosure into the smaller enclosure. Following the formation of the two enclosures, small wall nets were constructed on both sides of the Siruguda to guide and retain fish within the inner enclosure. Finally, the main wall net was constructed from the shore towards the interior of the Perunguda, forming the principal guiding component of the Pattivalai. The wall net directed fish moving with the prevailing water current towards the Perunguda and subsequently through the opening into the Siruguda, where they were retained for collection (Figure 2 & 3.).

The supporting structure of Pattivalai was traditionally constructed using wooden poles. However, in recent years, iron poles have increasingly been adopted as an upgraded alternative because of their structural strength and durability. Each iron pole costs approximately ₹1,500. Nevertheless, some fisherman continues to use wooden poles for Pattivalai construction. In the present study, a total of 50 poles were used for the supporting structure. The lower ends of the poles were sharpened to a pointed, pencil-like shape to facilitate their insertion and fixation into the seabed, with an estimated preparation cost of ₹500 per pole. Approximately 40 kg of fishing

net was used for constructing the enclosure and wall-net components, while approximately 5 kg of rope was used to secure the net to the supporting poles. The construction materials and pole preparation resulted in an estimated total cost of ₹1,22,500.

The installation of one Pattivalai required the participation of five fishermen, including the Pattivalai owner, And the installation process was generally completed within 4-5 hours. The owner participated in the installation but did not receive a labour charge. The remaining four fishermen were paid ₹1,000 each, resulting in a labour cost of ₹4,000. An additional ₹2,000 was spent on transportation and other installation-related expenses. Therefore, the total installation cost was approximately ₹6,000, and the combined estimated cost of construction and installation was ₹1,28,500.

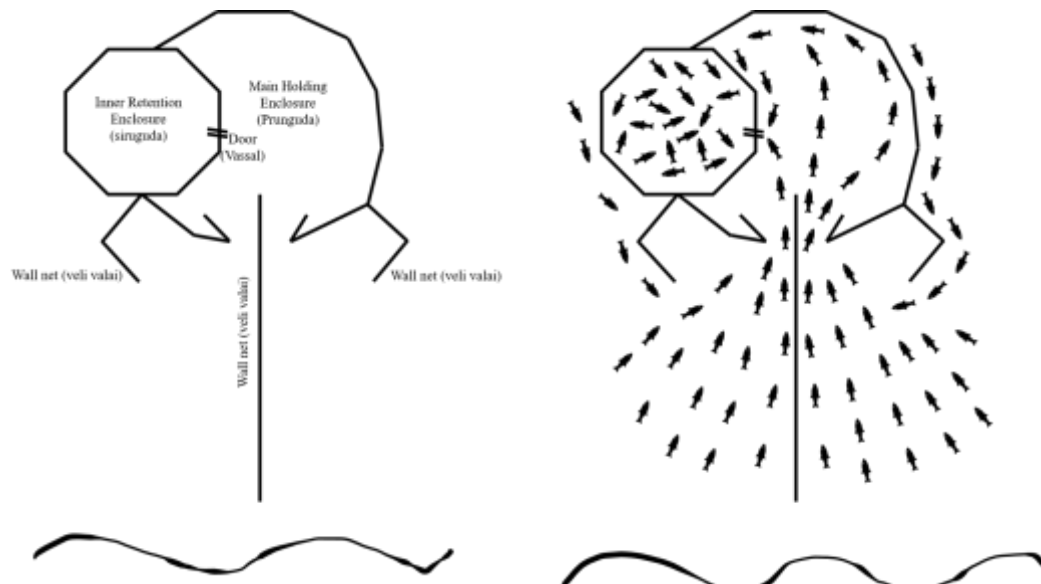


Figure 2. Schematic representation of the Pattivalai structure and wall nets guiding fish into the trap.

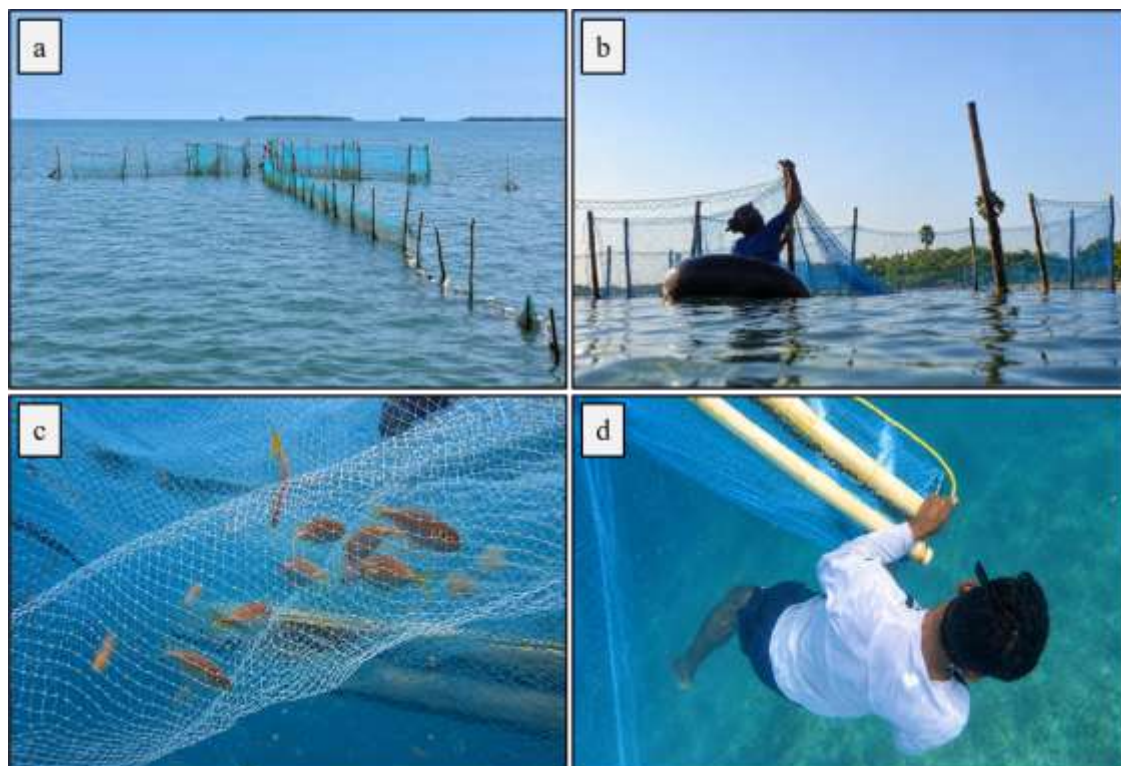


Figure 3. (a) Installed Pattivalai (shore fish trap) in the nearshore area; (b) attachment of the fishing net to the supporting poles using tyre-tube floats during Pattivalai construction; (c) fish retained within the inner

retention enclosure (Siruguda); and (d) fishermen removing the drag net (Kadipu) from the Pattivalai after harvesting the fish and transporting it towards the shore.

Maintenance and Net Replacement of Pattivalai

Maintenance of Pattivalai was primarily associated with the accumulation of algae and barnacles on the fishing net, which progressively affected the condition and fishing efficiency of the gear. Depending on the extent of algal and barnacle attachment, fishermen generally replaced the entire fishing net after approximately one month or more than one month of operation. This complete replacement of the net is locally referred to as “Valaipachal” (net replacement). Following replacement, the removed net was first sun-dried and subsequently cleaned using fresh water to remove attached algae, barnacles, and other fouling organisms. After cleaning, the fishermen stretched and inspected the net to identify damaged portions and carried out the necessary repairs. The repaired and cleaned net was then stored and prepared for subsequent Valaipachal operations.

Maintenance activities also varied according to sea conditions and seasonal fishing movements. During periods of rough sea conditions in the Gulf of Mannar, some fishermen shifted their Pattivalai operation to Palk Bay, where more suitable sea conditions allowed continued fishing. However, some fishermen did not shift their Pattivalai and continued operating in the Gulf of Mannar when conditions permitted. Before shifting the Pattivalai, the fishermen removed barnacle attachments from the supporting poles and carried out necessary maintenance of the structure. During such maintenance and relocation periods, the fishing net underwent the same Valaipachal procedure, including removal, sun-drying, freshwater cleaning, stretching, inspection, and repair of damaged sections. These maintenance practices helped to restore the condition of the net and supporting structure and enabled their reuse during subsequent fishing periods.

Seasonal variation in Pattivalai catch

The Pattivalai fishery exhibited seasonal variation in catch performance, with fishing activity distributed according to the prevailing seasonal conditions in the two fishing grounds. In the Gulf of Mannar, Pattivalai fishing was mainly practiced from November to April, whereas in the Palk Bay it was operated from May to October. The reported minimum catch remained 0 kg day⁻¹ in all four seasons, indicating that unsuccessful fishing days occurred throughout the fishing period. The reported maximum catch ranged from 48 to 60 kg day⁻¹, with the highest maximum catch recorded during the monsoon (60 kg day⁻¹), followed by the pre-monsoon (59 kg day⁻¹) and summer (57 kg day⁻¹) seasons. The lowest maximum catch was observed during the post-monsoon (48 kg day⁻¹).

The mean reported catch ranged from 12 to 17 kg trap⁻¹ day⁻¹. The highest mean catch was recorded during the pre-monsoon season (17 kg trap⁻¹ day⁻¹), followed by the monsoon (15 kg trap⁻¹ day⁻¹) and summer (14 kg trap⁻¹ day⁻¹) seasons, whereas the lowest mean catch was observed during the post-monsoon season (12 kg trap⁻¹ day⁻¹). Overall, catch performance was comparatively higher during the pre-monsoon and monsoon seasons and declined during the post-monsoon season. The seasonal fishing schedule, with operation from November-April in the Gulf of Mannar and May-October in Palk Bay, suggests that Pattivalai use was adjusted to periods of relatively favourable sea conditions in each fishing ground.

Socio economic impact

Pattivalai fishing provided an important supplementary source of income for fishers, while requiring relatively low daily expenditure and limited time commitment. The reported maximum daily selling value varied seasonally, ranging from ₹7,200 to ₹9,000. The highest reported maximum selling value was recorded during the monsoon season (₹9,000 day⁻¹), followed by the pre-monsoon (₹8,850 day⁻¹) and summer (₹8,550 day⁻¹) seasons, whereas the lowest value was observed during the post-monsoon season (₹7,200 day⁻¹). The reported minimum daily selling value was ₹0, reflecting days when no catch was obtained or sold (Table 2.). Daily fishing expenditure was relatively low, ranging from ₹0 to ₹300 day⁻¹. The low operating cost, together with the potential for relatively high daily returns, contributed to the economic value of the practice. Pattivalai fishing also involved a traditional profit-sharing arrangement locally referred to as “Pangu”, under which approximately 35% of the daily selling amount was provided to the co-fisherman, while the remaining 65% was retained by the primary fisher up to 0 to 6000. This arrangement enabled both fishers to benefit from the catch and provided an important form of income sharing within the fishing community.

The practice was also advantageous in terms of time efficiency. Harvesting fish from the Pattivalai generally required only 30 min to 1 h, while selling the catch required a further 30 min to 1 h. Thus, the entire harvesting and marketing process could generally be completed within approximately 2 h. Fishing activity was commonly carried out during the early morning, approximately 05:00–07:00 h or 06:00–08:00 h, after which fishers were able to engage in other fishing or livelihood activities. Therefore, Pattivalai functioned not only as a fishing

method but also as a time-efficient supplementary livelihood activity, providing additional income while allowing fishers to maintain other sources of employment.

Table 2. Seasonal minimum, maximum, and mean catch and maximum selling price recorded during the study

Seasons	min catch (kg/day)	max catch (kg/day)	Mean catch (kg trap ⁻¹ day ⁻¹)	max selling (rupees)
summer	0	57	14	8550
pre-monsoon	0	59	17	8850
monsoon	0	60	15	9000
post-monsoon	0	48	12	7200

Species catch composition

A total catch of 15.0 kg day⁻¹ was recorded, comprising 12 taxa (Table 1). *Loligo* sp. dominated the catch, contributing 26.00% (3.9 kg day⁻¹) of the total landings, followed by *Siganus* sp. (18.00%, 2.7 kg day⁻¹) and *Sphyrna* sp. (12.67%, 1.9 kg day⁻¹). *Gerres* sp. and *Sepioteuthis* sp. together accounted for a further 16.67% (8.67% and 8.00%, respectively), while *Lates* sp. contributed 5.33%. The remaining taxa *Epinephelus* sp., *Thunnus* sp., and *Sardina* sp. (4.00% each), *Netuma* sp. (2.67%), and *Carangoides* sp. (2.00%) together with an unresolved other species category (4.67%), each formed minor components of the catch (≤5%).

Overall, cephalopods (*Loligo* sp. and *Sepioteuthis* sp. combined) accounted for 34.00% of the total catch by weight, while finfish taxa collectively contributed the remaining 61.33%, indicating a catch composition numerically dominated by squid but taxonomically diverse across finfish groups. This pattern was further supported by diversity indices (Shannon–Wiener $H' = 2.195$; Pielou's evenness $J' = 0.883$; Simpson's dominance $D = 0.141$), reflecting a catch that, while led by *Loligo* sp., was not strongly dominated by any single taxon (Berger–Parker index = 0.260) (Figure 4.).

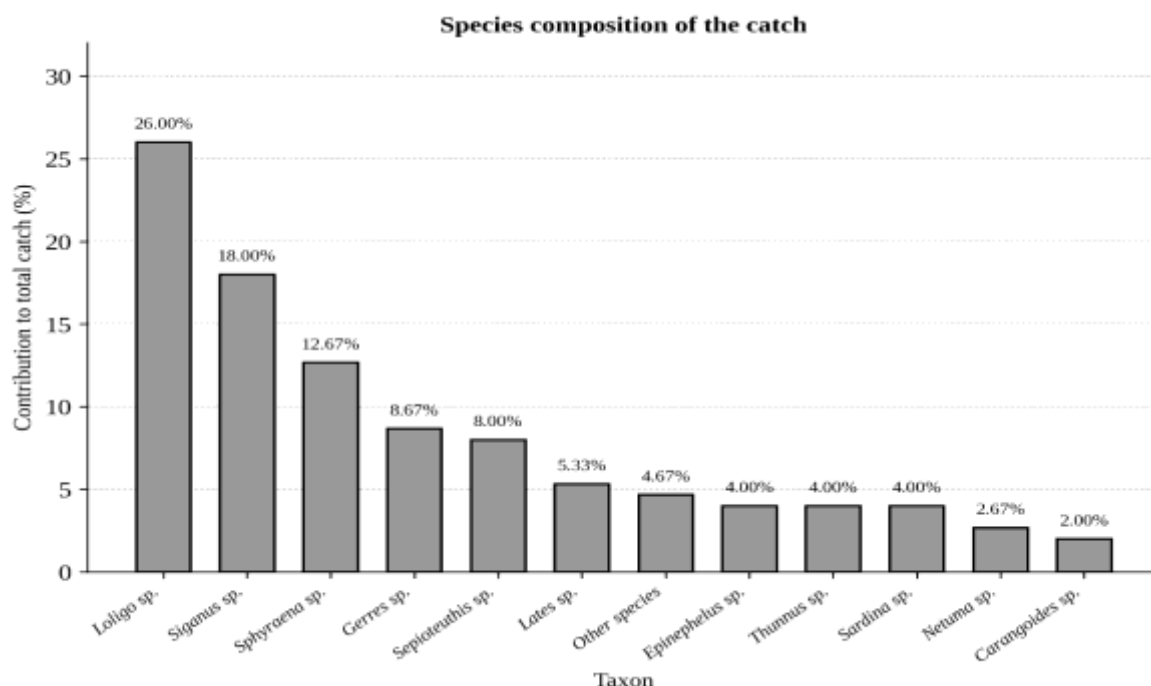


Figure 4. Species-wise composition and percentage contribution of the Pattivalai catch recorded during the study.

Discussion

Traditional knowledge and continuity of Pattivalai

Pattivalai represents a distinctive traditional fishing system maintained by the Sri Lankan Tamil fishing community in the Mandapam region. The practice involves locally developed knowledge of site selection, construction, installation, seasonal operation, harvesting and maintenance. Venkatesan (2010) reported that Pattivalai was

introduced by Sri Lankans residing in Mandapam Camp and subsequently operated along the Gulf of Mannar and Palk Bay. The continued practice of Pattivalai demonstrates the persistence of traditional ecological knowledge within the fishing community. Similar studies of Indian fishing communities have shown that fishers use local knowledge of environmental conditions, fishing grounds and seasonal changes to support fishing decisions (Salim and Monolisha, 2019; Pukkalla and Mohan, 2021; Roy et al., 2020).

Comparison with Venkatesan (2010) shows that the fundamental Pattivalai fishing concept has remained largely unchanged. Its shore-associated structure, guiding walls, retaining sections and seasonal operation continue to characterize the fishery. However, the present study indicates changes in construction materials, investment, maintenance practices and economic conditions. Venkatesan (2010) reported an initial investment of approximately ₹28,245–30,500 and daily returns of ₹100–300 per trap. The higher investment recorded in the present study likely reflects changes in material and labour costs and should not be interpreted directly as increased or decreased profitability without standardized economic comparisons.

Seasonal adaptation and relocation

Although Pattivalai is fixed at the fishing site during operation, it is not permanently maintained at the same location. Fishermen relocate the structure according to sea conditions, particularly when rough conditions make fishing unsuitable. This seasonal flexibility allows the fishing activity to continue in more favourable coastal areas. Such environmental adaptation is an important feature of traditional small-scale fisheries. Similar use of local weather and environmental knowledge for modifying fishing activities has been reported among Tamil Nadu fishing communities (Salim and Monolisha, 2019). Venkatesan (2010) also documented seasonal movement of Pattivalai between the Gulf of Mannar and Palk Bay.

Comparison with other traditional fishing methods

Pattivalai differs from mobile fishing gears because its main structure remains fixed while fish moving through nearshore waters are guided towards the retaining sections. The method therefore utilizes natural fish movement rather than continuous active searching. Similar adaptations to shallow coastal environments have been reported for traditional trap fisheries in the Mandapam region (Prabhu, 1954; Varghese et al., 2008). Compared with smaller traditional traps such as Koodu, Pattivalai has a larger shore-associated structure with guiding walls and retaining enclosures. This difference demonstrates how traditional fishing communities developed different gear designs according to local habitats, fish movements and fishing conditions (Prajith et al., 2023).

Catch composition

The present study recorded a mean catch of 15.0 kg day⁻¹, comprising several finfish and cephalopod taxa. *Loligo* sp. was the dominant component (3.9 kg day⁻¹; 26%), followed by *Siganus* sp. (2.7 kg day⁻¹; 18%) and *Sphyræna* sp. (1.9 kg day⁻¹; 12.67%). The presence of multiple taxa indicates that Pattivalai utilizes a diverse component of the nearshore fish assemblage. The high contribution of *Loligo* sp. may reflect its availability and movement within the shallow coastal fishing grounds. However, catch composition can also vary with season, habitat, water movement and fishing location. Therefore, the dominance of *Loligo* sp. should not be interpreted as gear selectivity alone.

Venkatesan (2010) similarly reported finfish, cephalopods and crustaceans from Pattivalai fishing. The present results therefore indicate continuity in the broad resource groups exploited by the gear, while providing updated information on the present catch composition.

Construction and technological adaptation

The present study recorded a total construction and installation expenditure of ₹1,28,500, demonstrating the substantial investment required to establish Pattivalai. Although wooden poles were traditionally used, the present use of iron poles indicates adaptation of the traditional structure to contemporary materials while retaining its basic fishing principle. Venkatesan (2010) documented pointed supporting poles, mesh walls and ropes as major components of Pattivalai construction. The similarity in the basic structure between the earlier and present observations indicates continuity of traditional construction knowledge despite changes in materials.

Maintenance practices

Net fouling by algae and barnacles was an important maintenance requirement in the present study. Fishermen periodically replaced the entire net, locally referred to as Valaipachal, followed by sun-drying, freshwater washing, stretching and repair of damaged sections. These practices help maintain the fishing efficiency and

extend the useful life of the net. Venkatesan (2010) also identified fouling organisms as an important maintenance problem and reported regular cleaning of the Pattivalai mesh. The continued importance of fouling control indicates that maintenance remains a major operational requirement of this fixed nearshore fishing system.

Economic contribution

The mean catch of 15 kg day⁻¹ and daily income of ₹0-₹5,000 indicate considerable variation in the economic returns from Pattivalai. Such variation is common in small-scale fisheries because catch and income depend on environmental conditions, species availability, season and fishing effort (Jena and George, 2018; Sundaram et al., 2024). An important economic feature of Pattivalai is that livelihood benefits extend beyond fish harvesting. Skilled community members also construct and install Pattivalai for other fishermen on a contractual basis. Thus, traditional knowledge provides an additional source of income through specialized construction and installation skills.

Conclusion

Pattivalai represents a distinctive traditional and adaptive fishing practice that continues to provide livelihood opportunities for fishing communities in the Mandapam region. The present study demonstrates that the method combines traditional knowledge of coastal conditions and fish movement with a fixed shore-associated fishing structure. The fishing and harvesting process can generally be completed within approximately 2 hours, after which fishermen can sell the catch and engage in other livelihood activities. Thus, Pattivalai provides an additional source of income without requiring fishermen to devote the entire day to fishing. The maintenance requirement of Pattivalai is also relatively periodic. Depending on fouling by algae and barnacles, the net is replaced through the locally practiced Valaipachal process approximately once a month or once in two months. This replacement requires only about 5 hours, after which the net can be dried, cleaned, repaired and prepared for subsequent use. The combination of short daily fishing duration and periodic maintenance makes Pattivalai a practical fishing system that can provide supplementary livelihood opportunities.

The significance of Pattivalai extends beyond its economic contribution. As a passive fishing method, the structure remains fixed while fish are guided and retained by the movement of water and fish through the fishing area, rather than being continuously pursued by active fishing operations. The method therefore has the potential to reduce disturbance to the surrounding marine environment compared with more intensive active fishing practices. However, its ecological effects, particularly on non-target species and associated habitats, should be evaluated through further field-based studies. Overall, Pattivalai represents a living traditional fishing knowledge system with ecological, economic and cultural significance. Its ability to generate additional income with limited daily fishing time, together with the continued use of traditional construction and maintenance knowledge, highlights its importance to coastal livelihoods. Proper documentation, ecological assessment and community participation can help promote the continued use of this traditional fishing practice while supporting the conservation and sustainable management of the marine environment.

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