2019

A Preliminary Report on the Status of Kayankerni Coral Reef, Sri Lanka

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1. INTRODUCTION

Coral reefs are among the most diverse natural ecosystems on earth. Despite encompassing less than 1% of the oceans, they account for a quarter of all marine species. These invaluable ecosystems provide many important services in the form of coastal protection, food security, recreation and livelihoods; supporting extensive fisheries and tourism industries across many tropical coastal nations. However, coral reefs are increasingly threatened by human impacts, and many reefs have already been lost or are being degraded at an alarming rate. Coral reef degradation is expected to have significant long-term impacts on many coastal communities and economies.

Sri Lanka has limited coral reef development, and true coral reefs are found in the Gulf of Mannar, along parts the east coast in the Batticaloa and Trincomalee districts, along the southern coast between Ambalangoda and Tangalle, and around the Jaffna Peninsula (Figure 1). However, these reefs support high species diversity with more than 200 species of stony corals and 900 species of reef associated fish species. Around 70% of total marine fish production comes from coastal waters and reef habitats (NARA 1998). Reef based tourism is an important income source in some locations while coral reefs also provide protection from storms and coastal erosion in many parts of the country.

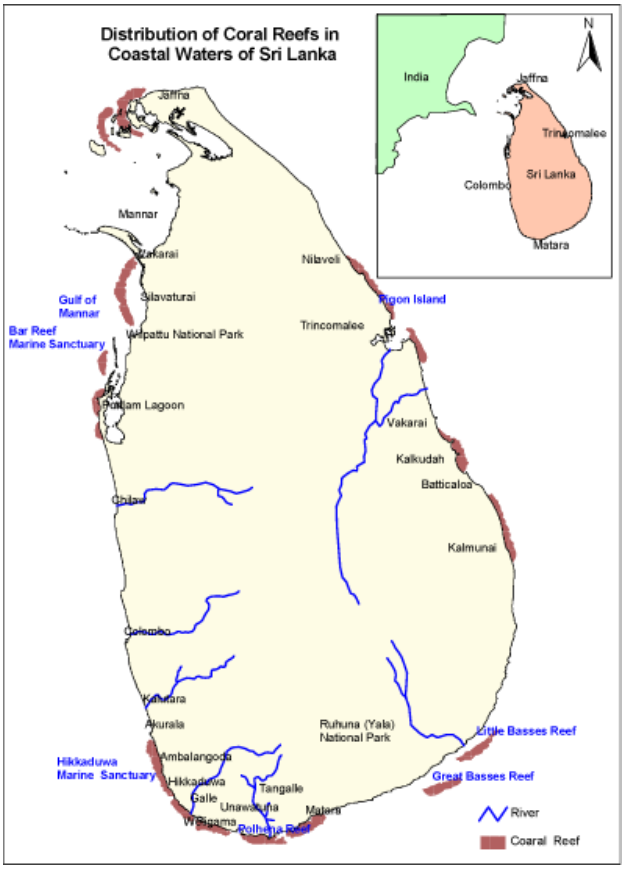


Figure 1: Map of Sri Lanka showing major reef areas (*Image Source: FAO*).

Coral reefs in Sri Lanka are threatened by both anthropogenic and natural impacts. Over harvesting and the use of destructive fishing methods (e.g. dynamite fishing) have destroyed many reefs and severely reduced biomass. The extraction of coral in the past for the construction industry has caused extensive damage to reefs. Uncontrolled tourism has resulted in damage from reef walking, boat anchoring and the collection of souvenirs. Nearshore reefs are increasingly impacted by land-based pollution and sedimentation.

Mass coral bleaching has had a major impact on coral reefs with major coral bleaching events in 1998 and 2016 with some shallow reefs suffering more than 90% mortality (Rajasuriya et al., 1999). For example, the live coral cover in healthy coral reefs such as the Bar Reef Marine Sanctuary declined from about 80% to less than 1% (Rajasuriya 2002). On the east coast, bleaching has been patchy; some reefs in Batticaloa were severely bleached whilst Pigeon Islands in Trincomalee was not affected at all (Rajasuirya et al., 2005). Recovery of affected reefs has been variable, with some reefs showing good signs of new coral recruitment and growth, while others have shown only marginal improvement since 1998 (Rajasuriya 2002). Most bleached reefs in Sri Lanka have lost their previously dominant coral species and have shown a shift in dominance towards other coral species or to other communities such as calcareous and filamentous algae (Rajasuriya 2002).

2. METHODS

2.1. General Description

Kayankerni reef is located north of Pasikudah on the east coast of Sri Lanka. Although fringing coral reefs are found along most of the coastline Pasikudah Bay and Kalkuda, many of these nearshore reefs are now in a degraded condition. In contrast, Kayankerni reef remains in a healthy condition and has suffered minimal impact from recent coral bleaching events and constitutes an important refuge for coral reef biodiversity on the east coast.

The reef consists of three separate coral areas, namely a fringing reef system around Elephant Point, a nearshore patch reef off Kayankerni located approximately 2km from the shoreline, and a coastal fringing reef along the shoreline, located parallel to the patch reef. extensive coral areas located around 1-2km off the coast. The fringing reef around Elephant Point (ELE) and the patch reef (KYK) were selected for long term monitoring. ELE consists of a nearshore fringing reef with a clearly defined reef lagoon, shallow reef crest and outer reef slope. KYK is a patch reef with a with a shallow sandy area in the middle. The seaward margins consist of spur and groove formations while the leeward margin consists of large coral domes and mixed coral and rock areas. Patchy marine seagrass habitats are found between the shoreline and the leeward edge of the reef.

The reef begins in Vandaloos Bay and spreads into Thennadi Bay around Elephant Point. The reef is also situated close to the seaward opening of the Valachchenai lagoon which constitutes one of the major drainage areas of the Maduru Oya basin. Other minor outflows are located north towards Vakarai lagoon and south towards Batticaloa lagoon. Valachchenai lagoon consists of extensive coastal wetland systems that include mangroves and seagrass habitats.

Figure 2: *Left* - foliose coral at Kayankerni Reef; *Right* - branching and foliose coral at Kayankerni reef.

The reef was popular for ornamental fish collection in the past but many decades of civil unrest in the area and a change in fishing practices has resulted in a decline of fish collection around Kayankerni. The reef is however still a vital resource for local small-scale and artisanal fishermen. Common fishing methods are gillnets, hook and line, and traps. Illegal and destructive fishing using explosives is practiced widely in the area. While this practice is mostly carried out in deeper water, it is likely that some dynamite fishing is also carried out in shallow coral areas. The reef is also increasingly becoming important for scuba-diving and snorkeling. The growth of the tourism industry in Pasikudah and surrounding areas is likely to increase the economic value of the reef and provide a variety for non-extractive resource uses with increased economic opportunities for local communities.

2.2 Survey Sites

The fringing reef around Elephant Point (ELE) and the patch reef (KYK) were selected for long term monitoring. Three representative sites were selected within each reef system (ELE1, ELE2, ELE3, KYK1, KYK2, and KYK3). After initial surveys, ELE1 was removed as a long-term survey site due to constraints in conducting underwater surveys due to poor visibility.

Figure 3: Kayankerni reef and survey area.

2.3 Underwater Surveys

BRT staff conducting a coral reef survey at Kayankerni

Benthic surveys were carried out using the Point Transect method described by English et al (1997) along a 50 m fiberglass tape laid on the reef. A diver using scuba equipment recorded benthic composition at every 50 cm point between 0.5 m - 50.0 m along the tape. At each intercept point a photograph was taken and the substrate was recorded after fieldwork was completed. Photographing the substrate and identifying categories and coral genera on land allowed for better data recording and lower number of identification errors. It also provided an opportunity to conduct benthic surveys by volunteers that may not be familiar with substrate categories. The substrate was categorized as live coral, dead coral, rock, soft coral, rubble, sand, algae, sponge, and other.

Fish surveys were conducted using the Belt Transect Method (English et al., 1997). A SCUBA diver using an underwater slate recorded fish within 2.5 m on either side of a 50 m fiberglass transect tape laid on the reef. Indicator species selected from initial baseline assessments carried out in 2016 were recorded for long term monitoring of reef fish assemblages. The following fish groups were recorded on belt transect surveys: Moray Eels, Lionfish, Groupers >30cm, Groupers <30cm, Snappers >30cm, Snappers <30cm, Emperors, Sweetlips, Goatfish, Butterflyfish, Angelfish, Anemonefish, Wrasses, Parrotfish, Surgeonfish, and Rabbitfish.

A total of 110 benthic transects and fish transects were conducted between 2017 and 2018.

Left – Preparing to load equipment for reef surveys; *Right* – Surfacing after a dive at Kayankerni reef

3. RESULTS

3.1 Substrate Composition

Transect surveys recorded a live hard coral cover of 39% on transects at KYK and a live hard coral cover of 31% on transects at ELE (Figure 2). Rock and rubble were the other main substrate categories recorded on transects.

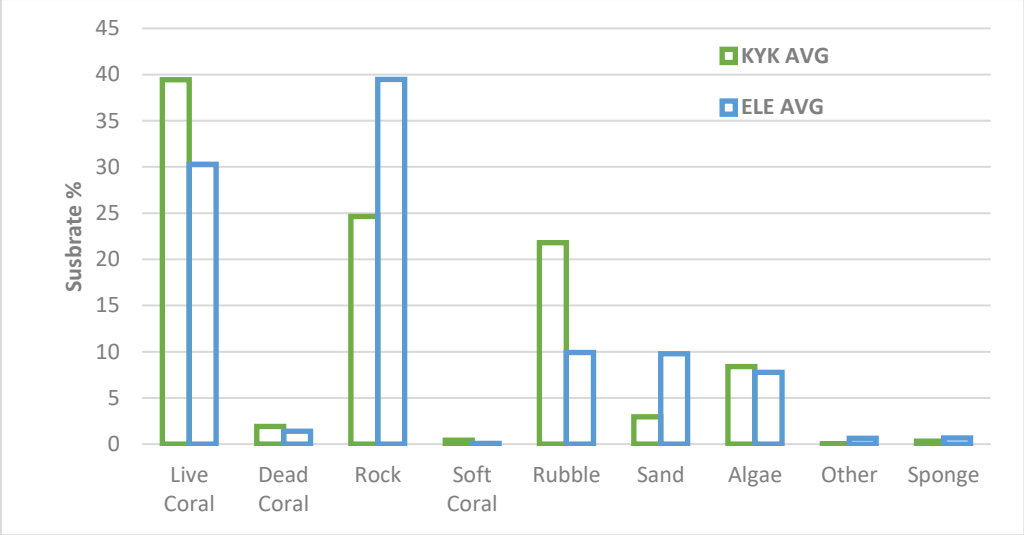


Figure 2: Comparison of percentage (%) cover of benthic categories between surveyed reefs.

Acropora and *Porites* were the most commonly recorded coral genera on transects at KYK followed by *Echinopora* (Figure 3). *Acropora* was the dominant genus recorded on transects at ELE with *Montipora* being the second most abundant coral genus on transects at ELE (Figure 3). Overall when compared together, transects at ELE had a higher cover of *Acropora* and *Montipora* while transects at KYK had a higher cover of *Porite*s and *Echinopor*a. Composition of coral genera among different sampling sites within KYK and ELE are show in Figures 4 & 5.

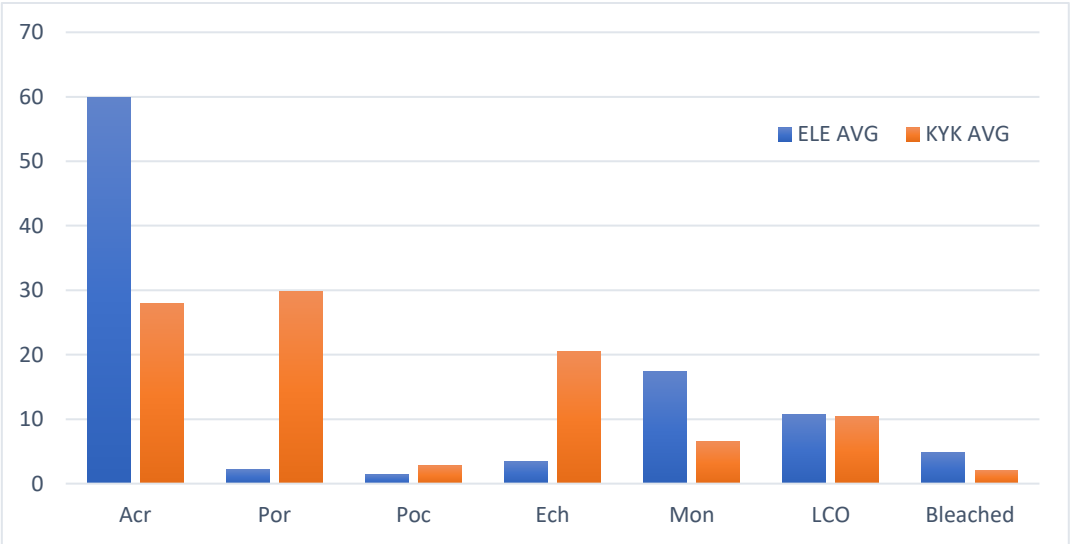


Figure 3: Comparison of major coral genera among all sampling sites at KYK Reef and ELE Reef (as a %).

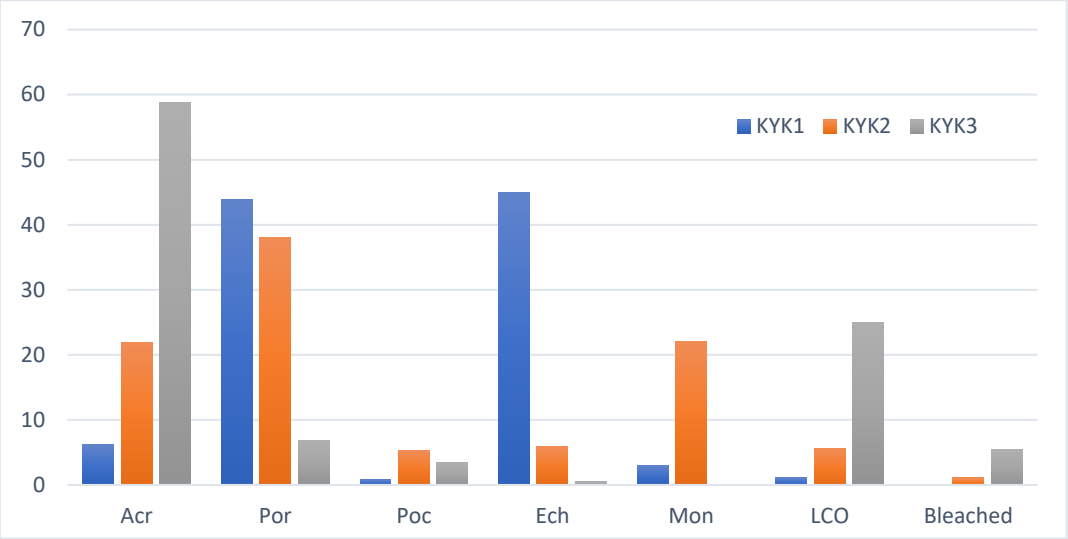


Figure 4: Percentage (%) cover of major coral genera among sampling sites at KYK Reef.

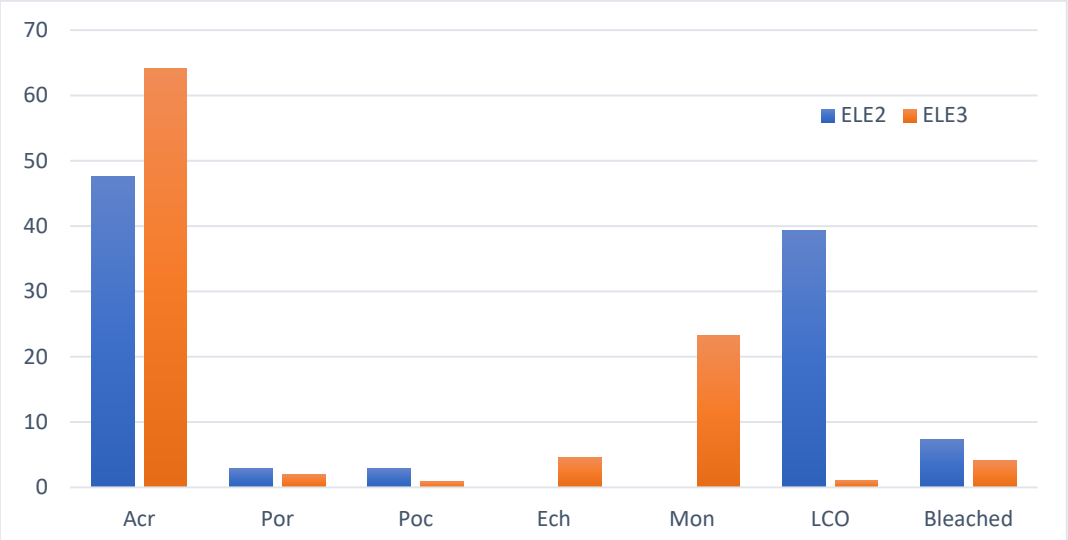
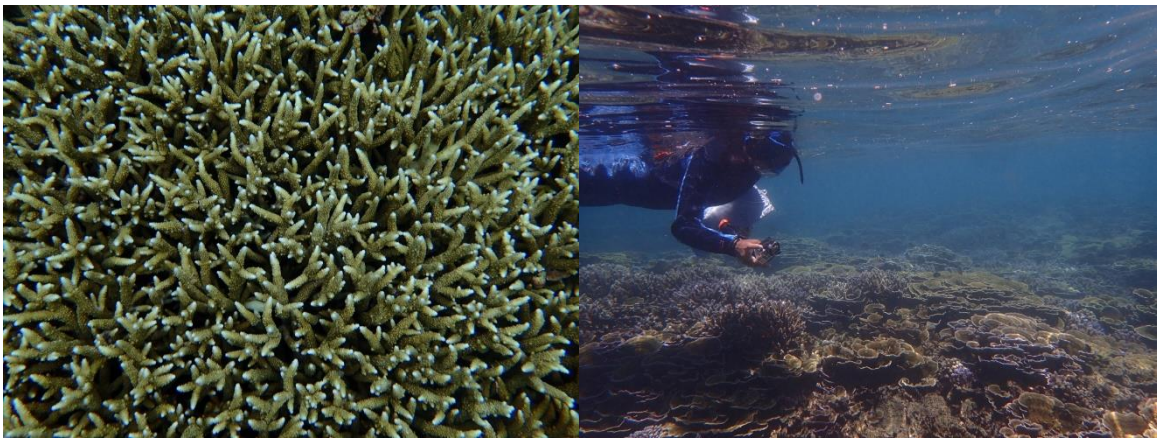


Figure 5: Percentage (%) cover of major coral genera among sampling sites at ELE Reef.

The ELE reef forms an extensive fringing reef system around the Elephant Point headland. The southern end of the reef consists mostly of degraded reef habitat with a mix of old dead coral, coral rubble, algal mats, and some isolated live coral colonies. Coral cover improves towards the western and northern sections of the reef with a mix of sub massive, encrusting, foliose, plate-like, digitate and branching coral colonies. Colonies of branching and plate like *Acropor*a are the most common coral colonies in this area.

The eastern section of the reef has the best live coral cover with large stands of branching *Acropora* and foliose *Montipora*. The seaward side of the reef consists of distinct spur and groove formations and some large boulders with a maximum depth of 6-7 m on the seaward

sand edge. There is a shallow reef crest exposed at low tide that creates a protected reef lagoon on the leeward side of the reef. The reef lagoon consists of isolated coral colonies, coral rock, coralline algae, and seagrass habitat.



Left - healthy corals at ELE3; *Right* – Photo documenting a shallow reef at ELE3

Left - healthy corals at KYK1; Right - large Porites dome near KYK1.

3.2 Reef Fish Assemblages

A total of 246 species of reef fish were recorded during the survey period (Table 1). The most common fish groups were parrotfish, surgeonfish, damselfish and wrasses. These four groups together with butterflyfish were selected for long term monitoring as indicator species of reef health, fish assemblage structure and fishing pressure. Large numbers of juvenile parrotfish were recorded indicating a healthy recruitment pattern to the reef. Eighteen species of butterflyfish were recorded with the most common being the Oval butterflyfish (*Chaetodon trifasciatus*), a species that feeds exclusively on coral polyps. Corallivores, or species that feed exclusively on live corals are considered an important bio-indicator of reef health.

From the major fish groups selected for monitoring, surgeonfish were the most commonly recorded species on transects at both KYK and ELE, followed by butterflyfish. Transects at KYK had higher numbers for all fish groups than transects at ELE except for parrotfish and rabbitfish. Although the third most abundant in number on transects, total parrotfish recorded on transects was relatively low with less than 10 individuals recorded per transect at both reefs. However, the presence of high numbers of butterflyfish on transects at both reef areas indicate a healthy reef system as most butterflyfish feed on live coral polyps and can be considered as an indicator of coral health and high coral cover.

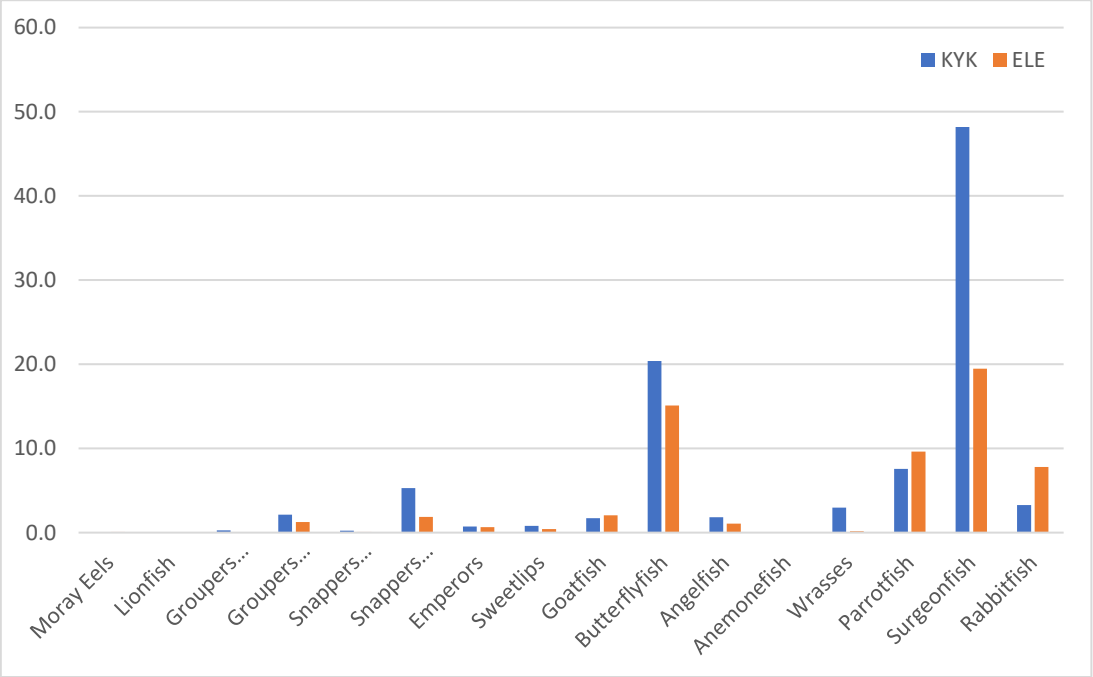


Figure 6: Number of fishes per transect for major fish groups at ELE and KYK reefs.

3.3 Impacts of Coral Bleaching

Kayankerni reef was significantly impacted by the 2016 coral bleaching event when nearly 60% of all live corals were bleached. Water temperature during this period ranged from 30-33^{o} C which can be considered to be above the normal range of 28-29^{o} C. This is consistent with patterns observed elsewhere in Sri Lanka where elevated water temperatures resulted in extensive coral bleaching. However, in comparison to major reefs on the west coast, Kayankerni reef remained bleached for an extensive period without suffering high mortality. Qualitative assessments in August and September indicated that bleached corals had completely recovered from the bleaching event. A similar pattern was observed on the reef in 2015 when most coral bleached in June and July but recovered completely by August. While the exact reasons for this remain unknown it is likely a combination of environmental, physical and biological factors that may result in increased resilience of the reef to the recent bleaching event. Data collected from temperature loggers deployed on the reef in 2017 indicated that the

coral reef was subjected to daily and seasonal variations in temperature with noticeable reduction in temperature around periods of high wind velocity.

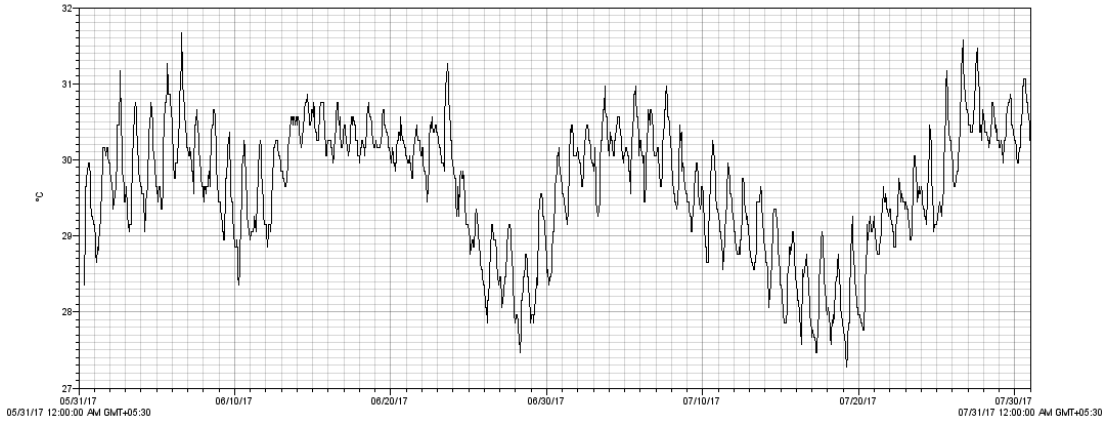


Figure 7. Water temperature at Kayankerni Reef between 31/05/2017 and 30/07/2017

3.4 Impacts of Nutrient Pollution

Valachchenai lagoon is the primary drainage point for the Maduru Oya river basin. Maduru Oya spans a length of 135km and has been extensive altered for irrigating the eastern plains for rice cultivation. There is also significant agriculture including rice cultivation in coastal areas around Kayankerni. Currently, there is no monitoring of water quality around the coral reef and a poor understanding on the impacts of agricultural practices on the coral reef. However, the excessive use of fertilizers and pesticides is likely to have impacts on nearshore coral reefs. Increase in urban wastewater and effluent from expanding shrimp farms in the area are also expected to impact coral reefs. The souther end of the Kayankerni reef system located closest to the Valachchenai lagoon mouth has lower coral cover and high algal cover indicating the influence of nutrients and sediments from the lagoon. Increased solid waste pollution, both from urban sources and the fisheries industry is also a major concern for both the coral reef and coastal ecosystems.

4. REFERENCES

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Annexe I. List of Reef Fish Species Recorded from the Kayankerni Area.

Family	Species
Acanthuridae	*Acanthurus blochii*
Acanthuridae	*Acanthurus dussumieri*
Acanthuridae	*Acanthurus leucosternon*
Acanthuridae	*Acanthurus lineatus*
Acanthuridae	*Acanthurus mata*
Acanthuridae	*Acanthurus tennenti*
Acanthuridae	*Acanthurus triostegus*
Acanthuridae	*Acanthurus xanthopterus*
Acanthuridae	*Ctenochaetus* spp.
Acanthuridae	*Naso hexacanthus*
Acanthuridae	*Naso lituratus*
Acanthuridae	*Naso unicornis*
Acanthuridae	*Zebrasoma scopas*
Acanthuridae	*Zebrasoma veliferum*
Apogonidae	*Apogon aureus*
Apogonidae	*Apogon kalopterus*
Apogonidae	*Apogon nigrofasciatus*
Apogonidae	*Archaemia furcata*
Apogonidae	*Cheilodipterus macrodon*
Apogonidae	*Cheilodipterus quinquelineatus*

Family	Species
Aulostomidae	*Aulostomus chinensis*
Balistidae	*Balistoides conspicillum*
Balistidae	*Balistoides viridescens*
Balistidae	*Balistapus undulatus*
Balistidae	*Melichthys indicus*
Balistidae	*Odonus niger*
Balistidae	*Pseudobalistes flavimarginatus*
Balistidae	*Rhinecanthus rectangulus*
Balistidae	*Rhinecanthus aculeatus*
Balistidae	*Sufflamen chrysopterus*
Belonidae	*Strongylura incisa*
Blenniidae	*Aspidontus taeniatus*
Blenniidae	*Cirripectes* sp.
Blenniidae	*Ecsenius bicolor*
Blenniidae	*Ecsenius yaeyamaensis*
Blenniidae	*Istiblennius* sp.
Blenniidae	*Meiacanthus smithi*
Blenniidae	*Salarias* sp.
Caesionidae	*Caesio caerulaurea*
Caesionidae	*Caesio cuning*

Caesionidae	*Caesio xanthonota*
Caesionidae	*Pterocaesio pisang*
Caesionidae	*Pterocaesio tesselata*
Caesionidae	*Pterocaesio tile*
Carangidae	*Carangoides ferdau*
Carangidae	*Caranx melampygus*
Carangidae	*Gnathanodon speciosus*
Carangidae	*Trachinotus baillonii*
Carcharhinidae	*Carcharhinus melanopterus*
Chaetodontidae	*Chaetodon auriga*
Chaetodontidae	*Chaetodon citrinellus*
Chaetodontidae	*Chaetodon collare*
Chaetodontidae	*Chaetodon decussatus*
Chaetodontidae	*Chaetodon ephippium*
Chaetodontidae	*Chaetodon falcula*
Chaetodontidae	*Chaetodon guttatissimus*
Chaetodontidae	*Chaetodon kleinii*
Chaetodontidae	*Chaetodon lineolatus*
Chaetodontidae	*Chaetodon lunula*
Chaetodontidae	*Chaetodon melannotus*
Chaetodontidae	*Chaetodon meyeri*
Chaetodontidae	*Chaetodon plebeius*
Chaetodontidae	*Chaetodon triangulum*
Chaetodontidae	*Chaetodon trifascialis*

Chaetodontidae	*Chaetodon trifasciatus*
Chaetodontidae	*Chaetodon vagabundus*
Chaetodontidae	*Forcipiger flavissimus*
Chaetodontidae	*Hemitaurichthys zoster*
Chaetodontidae	*Heniochus acuminatus*
Chaetodontidae	*Heniochus pleurotaenia*
Chaetodontidae	*Heniochus singularis*
Cirrhitidae	*Cirrhitus pinnulatus*
Cirrhitidae	*Cirrhitichthys bleekeri*
Cirrhitidae	*Paracirrhites arcatus*
Cirrhitidae	*Paracirrhites forsteri*
Dasyatidae	*Dasyatis kuhlii*
Dasyatidae	*Himantura uarnak*
Dasyatidae	*Pastinechus sephen*
Dasyatidae	*Taeniura meyeni*
Diodontidae	*Diodon liturosus*
Ephippidae	*Platax teira*
Fistularidae	*Fistularia commersonii*
Gerridae	*Gerres sp*
Gobiidae	*Gobiodon sp*
Gobiidae	*Valenciennea spp*
Kyphosidae	*Kyphosus sp*
Haemulidae	*Plectorhinchus ceylonensis*
Haemulidae	*Plectorhinchus schotaf*

Haemulidae	*Plectorhinchus sp*
Haemulidae	*Plectorhinchus vittatus*
Haemulidae	*Pomadasys sp*
Hemiramphidae	*Hemiramphus sp*
Holocentridae	*Myripristis adusta*
Holocentridae	*Myripristis murdjan*
Holocentridae	*Myripristis vittata*
Holocentridae	*Neoniphon opercularis*
Holocentridae	*Neoniphon sammarra*
Holocentridae	*Sargocentron caudimaculatum*
Holocentridae	*Sargocentron cornutum*
Holocentridae	*Sargocentron diadema*
Holocentridae	*Sargocentron rubram*
Holocentridae	*Sargocentron spiniferum*
Labridae	*Anampses lineatus*
Labridae	*Bodianus neilli*
Labridae	*Choerodon cyanodus*
Labridae	*Cheilinus chlorourus*
Labridae	*Cheilinus undulatus*
Labridae	*Cheilio inermis*
Labridae	*Coris batuensis*
Labridae	*Coris frerei*
Labridae	*Epibulus insidiator*
Labridae	*Gomphosus caeruleus*

Labridae	*Halichoeres hortulanus*
Labridae	*Halichoeres marginatus*
Labridae	*Halichoeres nebulosus*
Labridae	*Halichoeres timorensis*
Labridae	*Halichoeres margaritaceus*
Labridae	*Hemigymnus fasciatus*
Labridae	*Hemigymnus melapterus*
Labridae	*Hologymnosus doliatus*
Labridae	*Labroides bicolor*
Labridae	*Labroides dimidiatus*
Labridae	*Labrichthys unilineatus*
Labridae	*Macropharyngodon ornatus*
Labridae	*Stethojulis trilineata*
Labridae	*Thalassoma amblycephalum*
Labridae	*Thalassoma hardwicke*
Labridae	*Thalassoma janseni*
Labridae	*Thalassoma lunare*
Leognathidae	*Leiognathus sp*
Lethrinidae	*Gnathodentex aurolineatus*
Lethrinidae	*Lethrinus harak*
Lethrinidae	*Lethrinus olivaceus*
Lutjanidae	*Aphareus sp*
Lutjanidae	*Lutjanus decussatus*
Lutjanidae	*Lutjanus fulviflamma*

Lutjanidae	*Lutjanus fulvus*
Lutjanidae	*Lutjanus kasmira*
Lutjanidae	*Lutjanus lunulatus*
Lutjanidae	*Lutjanus lutjanus*
Lutjanidae	*Lutjanus quinquelineatus*
Lutjanidae	*Lutjanus rivulatus*
Lutjanidae	*Macolor niger*
Malacanthidae	*Malacanthus brevirostris*
Microdesmidae	*Ptereleotris evides*
Monodactylidae	*Monodactylus argenteus*
Monocanthidae	*Aluterus scriptus*
Monocanthidae	*Amanses scopas*
Monocanthidae	*Cantherines pardalis*
Mugilidae	*Mugil sp*
Mullidae	*Mulloidichthys flavolineatus*
Mullidae	*Parupeneus barberinus*
Mullidae	*Parupeneus bifasciatus*
Mullidae	*Parupeneus cyclostomus*
Mullidae	*Parupeneus indicus*
Mullidae	*Parupeneus macronema*
Mullidae	*Upeneus tragula*
Muraenidae	*Echidna nebulosa*
Muraenidae	*Gymnothorax flavimarginatus*
Muraenidae	*Gymnothorax favagineus*

Muraenidae	*Gymnothorax javanicus*
Muraenidae	*Gymnothorax meleagris*
Muraenidae	*Myrichthys colubrinus*
Muraenidae	*Siderea grisea*
Nemipteridae	*Scolopsis bilineatus*
Nemipteridae	*Scolopsis bimaculatus*
Nemipteridae	*Scolopsis vosmeri*
Nemipteridae	*Scolopsis xenochrous*
Ostraciidae	*Ostracion cubicus*
Ostraciidae	*Ostracion meleagris*
Pempheridae	*Pempheris sp*
Pinguipedidae	*Parapercis clathrata*
Pinguipedidae	*Parapercis sp*
Pomacanthidae	*Apolemichthys xanthurus*
Pomacanthidae	*Centropyge flavipectoralis*
Pomacanthidae	*Centropyge multispinis*
Pomacanthidae	*Pomacanthus annularis*
Pomacanthidae	*Pomacanthus imperator*
Pomacanthidae	*Pomacanthus semicirculatus*
Pomacentridae	*Abudefduf septemfasciatus*
Pomacentridae	*Abudefduf sordidus*
Pomacentridae	*Abudefduf vaigiensis*
Pomacentridae	*Amphiprion nigripes*
Pomacentridae	*Amphiprion sebae*

Pomacentridae	*Chromis dimidiata*
Pomacentridae	*Chromis ternatensis*
Pomacentridae	*Chromis viridis*
Pomacentridae	*Chromis sp*
Pomacentridae	*Chrysiptera leucopoma*
Pomacentridae	*Chrysiptera unimaculata*
Pomacentridae	*Dascyllus aruanus*
Pomacentridae	*Dascyllus carneus*
Pomacentridae	*Dascyllus trimaculatus*
Pomacentridae	*Neoglyphidodon bonang*
Pomacentridae	*Neopomacentrus asyzron*
Pomacentridae	*Neopomacentrus taeniourus*
Pomacentridae	*Plectroglyphidodon dickii*
Pomacentridae	*Plectroglyphidodon lacrymatus*
Pomacentridae	*Plectroglyphidodon leucozonus*
Pomacentridae	*Pomacentrus chrysurus*
Pomacentridae	*Pomacentrus indicus*
Pomacentridae	*Pomacentrus philippinus*
Pomacentridae	*Pomacentrus similis*
Pomacentridae	*Pomacentrus coelestis*
Pomacentridae	*Stegastes nigricans*
Priacanthidae	*Priacanthus hamrur*
Pseudochromidae	*Pseudochromis fuscus*

Scaridae	*Cetoscarus bicolor*
Scaridae	*Chlorurus rhakoura*
Scaridae	*Leptoscarus* sp.
Scaridae	*Scarus frenatus?*
Scaridae	*Scarus ghobban*
Scaridae	*Scarus niger*
Scaridae	*Scarus rubroviolaceus*
Scaridae	*Scarus russelli*
Scaridae	*Scarus sordidus*
Scaridae	*Scarus* spp.
Scorpaenidae	*Pterois volitans*
Scorpaenidae	*Scorpaenopsis oxycephala*
Serranidae	*Aethaloperca rogaa*
Serranidae	*Cephalopholis argus*
Serranidae	*Cephalopholis formosa*
Serranidae	*Cephalopholis miniata*
Serranidae	*Diploprion bifasciatum*
Serranidae	*Epinephelus caeruleopunctatus*
Serranidae	*Epinephelus fasciatus*
Serranidae	*Epinephelus hexagonatus*
Serranidae	*Epinephelus longispinis*
Serranidae	*Epinephelus malabaricus*
Serranidae	*Epinephelus merra*
Serranidae	*Grammistes sexlineatus*

Serranidae	*Pseudanthias squamipinnis*
Siganidae	*Siganus argenteus*
Siganidae	*Siganus canaliculatus*
Siganidae	*Siganus javus*
Siganidae	*Siganus lineatus*
Siganidae	*Siganus stellatus*
Siganidae	*Siganus virgatus*
Syngnathidae	*Corythoichthys* sp

Synodontidae	*Synodus* sp
Tetraodontidae	*Arothron meleagris*
Tetraodontidae	*Arthron nigropunctatus*
Tetraodontidae	*Canthigaster solandri*
Tetraodontidae	*Canthigaster valentini*
Torpedinidae	*Torpedo fuscomaculata?*
Zanclidae	*Zanclus cornutus*

Annex II

First Stakeholder Consultation in Pasikudah
February 13th 2019

A stakeholder consultation workshop was held on February 13th at Nandawanam Guest House in Kalkudah. The workshop aimed to bring together relevant stakeholders that included government agencies, regulators and the local community representing both the fisheries and agricultural communities. Representatives from the Department of Fisheries and Aquaculture (DFAR), the Marine Environmental Protection Agency (MEPA), The Valachchenai Fishing Boat Owners Association, Valachchenai Fisheries Society, Kayankerni Fisheries Society, Kayankerni Farmers Society, and the Pasikudah Small Hoteliers Association attended the workshop. The participants were welcomed by Nishan Perera from Blue Resources Trust, who also mediated the workshop. Christoper Cox from UNEP and Sivaji Patra from SACEP provided a brief overview of the project and the importance if mitigating detrimental impacts on coral reefs. Solid waste pollution was identified by all participants as a major problem in the area with negative impacts on both the lagoon and coastal environments. It was clearly stated that fish catches had declined and the overall ecosystem health had deteriorated over time. Urban solid waste pollution and poor waste management practices were identified as a major issue. MEPA is currently looking at improving waste management at fisheries harbours and is conducting awareness programs for fishing communities. They are also conducting water quality monitoring at popular beaches. Solid waste management was also highlighted as an issue in the tourism sector. In addition, sewage treatment and discharge of black water effluent into Pasikudah Bay was highlighted as an issue that may lead to eutrophication of a local lagoon and pollution of Pasikudah Bay. Professor Sarath Nissank questioned the farmers society about agricultural practices, and in particular the use of fertilizers and pesticides. It was evident that the overuse of both fertilizers and pesticides was a common problem as with upriver areas. While all participants were aware of the major issues there appeared to be no concerted effort to mitigate pollution impacts. Providing a clear plan and with both short term and long-term targets that are achieved through activities undertaken under one central program rather than separate sectoral strategies is required in order to address the issues identified during the workshop.

Second Stakeholder Consultation in Kayankerni together with MEPA for Water Quality and sustainable Fisheries

11-12th April 2019

Kayankerni reef is a shallow, coastal coral reef system located north of Pasikudah in the Batticaloa District. The reef has been identified as an important refuge for marine biodiversity and remains as one of the last healthy coral reef systems in Sri Lanka. As with other coral reefs in Sri Lanka, it is threatened by overfishing, destructive fishing, pollution and coral bleaching. However, the reef has shown significant resilience to coral bleaching compared to other reefs in Sri Lanka. Kayankerni reef was declared as a Marine Sanctuary on April 12th 2019 and the government is in the process of developing a management plan for the MPA. The reef is influenced by freshwater runoff from the Maduru Oya catchment basin which empties into the ocean through the Valachchenai estuary. Several smaller water bodies also enter the ocean north of Valachchenai. Poor agricultural practices and land use has resulted in increased nutrient and sediment output around Sri Lanka including Valachchenai. In addition, urban and industrial waste, as well as effluent from shrimp farms are potential threats to water quality and coral reef health in the area. With the declaration of the MPA it is important that managing water quality and pollution impacts are considered in developing overall management actions for the area. Increased nutrients may result in the proliferation of coral disease, coral mortality and algal blooms that over time will lead to long term degradation of the Kayankerni coral reef. Initial field studies conducted on the reef by Blue Resources Trust indicate a live coral cover of almost 40%, which is higher than most other reefs in Sri Lanka after recent coral bleaching events. The reef also supports a high fish diversity of more than 200 reef fish species including an abundance of butterflyfish; that are a sign of a healthy coral reef ecosystem with high live coral cover. Monitoring water quality around the reef along with a comprehensive monitoring program along the Valachchenai estuary and watershed of the Maduru Oya is important in understanding pollution impacts on Kayankerni reef. Regular monitoring is required to identify sources and level of input of pollutants and in developing mitigation measures. The Marine Environment Protection Agency (MEPA) currently conducts basic water quality monitoring in public beaches in the area. It is proposed that this monitoring be expanded to document water quality along the coastline including the coral reef, as well as the Valachchenai estuary.