PMMSY- Promotion of Sustainable Fisheries and Livelihood of Kerala Coast through Artificial Reefs- Establishment of Artificial Reefs along the coast of Kerala- Phase I

PROJECT COMPLETION REPORT

Kerala State Coastal Area Development Corporation Limited

Promotion of Sustainable Fisheries and Livelihood of Kerala Coast through Artificial Reefs- Establishment of Artificial Reefs along the coast of Kerala

I. Introduction

Foreseeing the immense potential for development of fisheries and for providing focused attention to the sector, the Government of India in May, 2020 approved the "Pradhan Mantri Matsya Sampada Yojana (PMMSY) – A scheme to bring about Blue Revolution through sustainable and responsible development of fisheries sector in India" with an estimated investment of Rs. 20050 crores comprising of (i) Central share of Rs. 9407 crores, (ii) State share of Rs 4880 crores and (iii) Beneficiaries contribution of Rs. 5763 crores for its implementation for a period of 5 years from FY 2020-21 to FY 2024-25 in all States/Union Territories

One of the primary objectives of PMMSY is to double the income of the fishers. The only way the income of small- scale fishers can be increased is through improving coastal fisheries and increasing its yield through artificial reefs and sea ranching which will boost the per capita catch and reduce cost of fishing efforts. In addition artificial reefs will discourage bottom trawling in the near shore areas help the marine environment to regenerate and to that extent, help the small-scale fishers to get higher catch.

In view of the above, Department of Fisheries, Government of India intends to assist the States/ Union Territories under the Pradhan Mantri Matsya Sampada Yojana (PMMSY) scheme for installation of artificial reefs and for undertaking sea ranching activities in their coastal waters. The scheme envisages in installation of at least one reef set in each of the 3477 coastal villages of the country to showcase its utility and to help the small scale fishers residing in them. The target for 2022-23, 2023-24 and 2024-25 has been tentatively fixed as 1200, 1200 and 1100 respectively.

In accordance to the above, GOI vide order No. j-01012/12/2023-Fy dated 14.03.2023 had accorded sanction for The project " ***PMMSY- Government of Kerala- Additional Proposal on establishment of artificial reefs along the coast of Kerala under CSS component of Pradhan Mantri Matsya Sampada Yojana during 2022-23"*** at a total cost of Rs. 13.02 Crore wit6h central assistance4 of Rs. 7.812 crore and state assistance of Rs. 5.208 crore under non-beneficiary oriented CSS component of PMMSY. The unit cost of the project is Rs. 31.00 lakh.

State Government vide order No. G.O(Rt) No. 417/2023/F&PD dated 26.05.2023 had issued Administrative Sanction for the implementation of the project.

II. Project Objective

- To enhance the overall fish availability off the coast of Trivandrum
- To protect sensitive habitats from over fishing activities
- To restore fishery deficient habitat
- To provide suitable habitat to fish to congregate and colonies.
- To enhance fish productivity
- To revitalize aquatic environment
- To uplift socio – economic status of fishermen

III. The Project

The project envisioned the strategic deployment of 150 reef modules along the coast, specifically designed to enhance marine ecosystems and benefit the coastal fishing communities. These modules consisted of three distinct varieties: 80 triangular-shaped reefs, 35 flower-shaped reefs, and 35 well-ring (fused pipe) shaped reefs. Each type was carefully selected for its unique contribution to fostering marine biodiversity and improving fish habitat. These reef structures were deployed across 42 fishing villages in the Trivandrum district, offering long-term support to the livelihoods of local fishers by promoting sustainable fishing practices and revitalizing the marine environment.

IV. Project Implementation

The Technical Sanction for the project was formally issued on 20th May 2023, under the reference number 3/KSCADC/2023-24, for a total approved amount of Rs. 12.29 crore. Following a competitive bidding process, the contract for the execution of the work was awarded to M/s VPM Projects, based in Salem, Tamil Nadu, who emerged as the lowest bidder. Subsequently, an agreement was signed with the firm on 11th August 2023, marking a key milestone in the project's progress. This agreement paved the way for the timely commencement and completion of the works, ensuring the project objectives are met in a cost-effective and efficient manner.

According the site for casting was handed over to Contractor on 11.08.2023 and the casting of the reefs were commenced by the Contractor of 16.09.2023.

Image 1. Commencement of Casting

Image 2. Casting of Reefs in progress

Image 3. Monitoring of Reef casting by MD, KSCADC and other higher Officials

Image 4. Monitoring of casted reefs by Dr. Joe Kizhakkuden, Scientist, CMFRI

Image 5. Well ring type casted

Image 6. Triangular type casted

Image 7. Floral type casted

Image 8. Numbering of Reefs

On 17th January 2024, Shri Parshottam Rupala, Hon'ble Union Minister for Fisheries, Animal Husbandry & Dairying, officially inaugurated the reef deployment project via video conferencing. In his inaugural address, the Hon'ble Minister emphasized the transformative impact this initiative would have on the livelihoods of Kerala's traditional fishermen. He highlighted that the deployment of artificial reefs off the coast of Kerala's fishing villages is expected to significantly boost the overall income of the fisherfolk by enhancing fish habitats and improving catch yields.

Following the virtual inauguration, the deployment barge was ceremonially flagged off by Shri Saji Cherian, Hon'ble Minister for Fisheries, Culture, and Youth Affairs, Government of Kerala. In his remarks, the Hon'ble Minister underscored the importance of this innovative project, co-funded by both the Central and State governments, as a vital step towards promoting sustainable fishing practices and fostering long-term economic benefits for the coastal communities. The deployment of the reef modules commenced immediately after the inaugural ceremony, marking the beginning of a project that will not only protect marine ecosystems but also secure a brighter future for Kerala's fishing communities.

Image 9. Virtual Inauguration by Shri Shri Parshottam Rupala, Hon'ble Union Minister for Fisheries, Animal Husbandry & Dairying

Image 10. MOU with ARSC Members for future monitoring

Image 11. Flag off by Shri. Saji Cherian, Hon'ble State Minister for Fisheries, Culture and Youth Affairs

Image 12. Official Inauguration

Deployment of Artificial reef modules off the coast of selected 42 fishing villages of the State were done

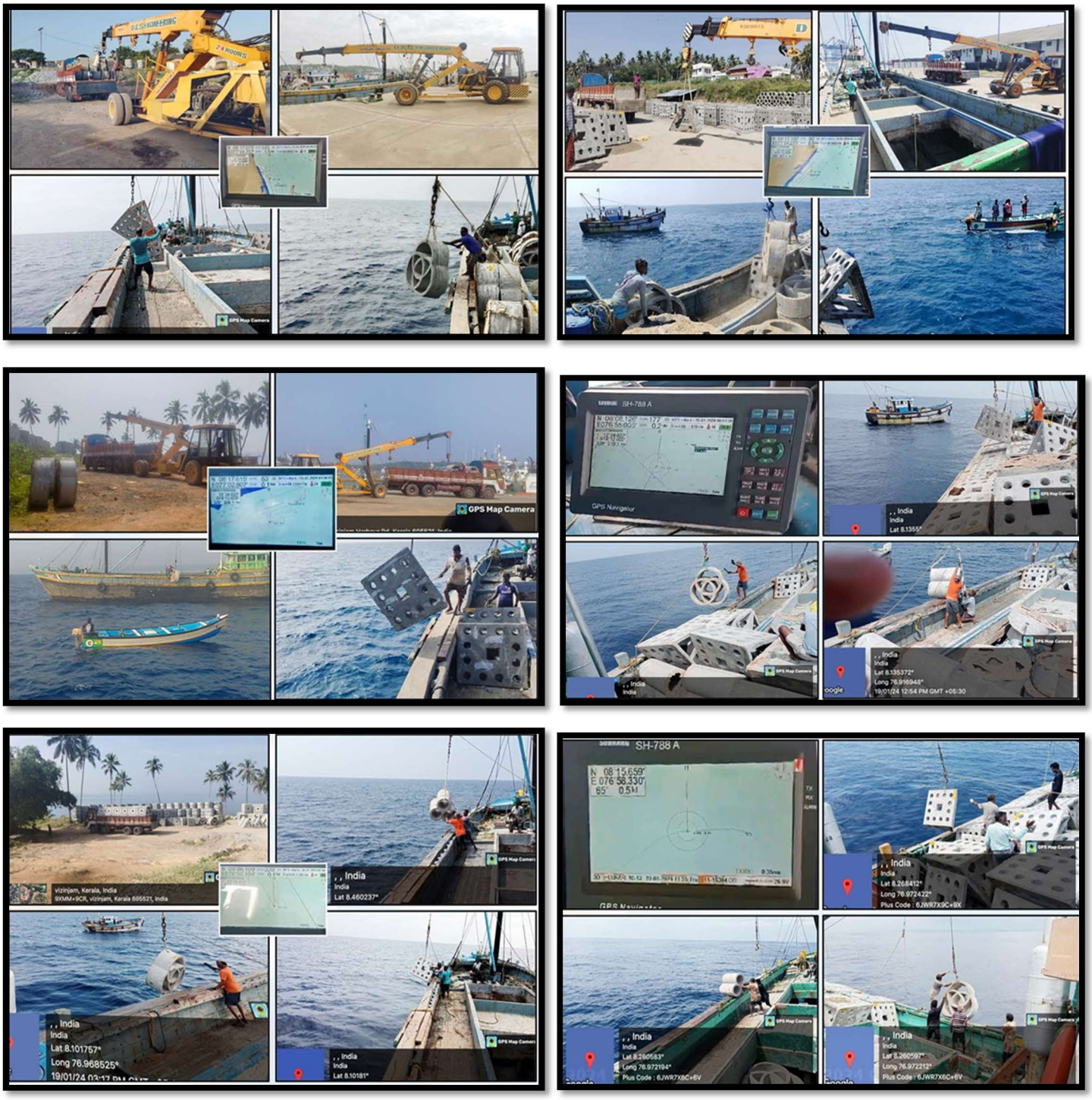

Image 13. Snapshot of Reef deployment in various fishing villages

The project involved the extensive deployment of 6,300 artificial reef modules along the coastline, directly benefitting 42 fishing villages in the Thiruvananthapuram district. These reef modules were designed in three distinct varieties: 80 triangular units, 35 floral-shaped units, and 35 fused pipe (well-ring) units, each carefully placed across the selected fishing villages. Constructed from reinforced cement concrete (RCC), each reef module was engineered for long-term durability, with an individual weight of one tonne, ensuring stability and resistance against harsh marine conditions.

The positioning of the modules was meticulously carried out using GPS technology to ensure precision. They were strategically deposited on the seabed at depths ranging from 12 to 16 fathoms, creating new habitats to foster marine biodiversity and increase fish populations. The entire process was conducted in the presence of traditional fishermen and fisheries officials, who actively participated in the project. This collaboration underscored the significance of the reefs in supporting sustainable fishing practices, providing a vital boost to the livelihoods of local fishing communities while simultaneously contributing to the regeneration of the marine ecosystem.

The details of the fishing villages and the co-ordinates were in the reef modules were deployed are given in Table. 1

Table 1. Details of Artificial Reef Deployment in 42 fishing villages

Sl.No	Date	Name of fishing village	Name of LSGD	Coordinates	
				Longitude	Latitude
1	10.01.2024	South Kollengode Location 1	Karode & Kulathoor	N 08.17.162	E 077.04.861
2	10.01.2024	South Kollengode Location 2	Karode & Kulathoor	N 08.17.071	E 077.04.775
3	14.01.2024	Paruthiyoor Location 1	Kulathur	N 08.17.145	E 077.04.334
4	14.01.2024	Paruthiyoor Location 2	Kulathur	N 08.17.100	E 077.04.275
5	15.01.2024	Poovar	Poovar	N 08.17.615	E 077.02.807
6	19.01.2024	Karumkulam	Karumkulam	N 08 08 126	E 076 55 005
7	19.01.2024	Kochuthura	Karumkulam	N 08 06 109	E 076 58 104
8	20.01.2024	Puthiyathura	Karumkulam	N 08 15 839	E 076 58 858

9	20.01.2024	Pallam	Karumkulam	N 08 15 659	E 076 58 330
10	21.04.2024	Pulluvla	Karumkulam	N 08 14 410	E 076 59 365
11	21.01.2024	Adimalathura	Kottukal	N 08 18 665	E 076 57 438
12	04.02.2024	Chowara	Kottukal	N 08 19 665	E 076 59 917
13	22.01.2024	Vizhinjam south	TVM Corporation	N 08 18 250	E 076 57 220
14	17.01.2024	Vizhinjam North Location 1	TVM Corporation	N 08.20.974	E 076 57 973
15	09.02.2024	Vizhinjam North Location 2	TVM Corporation	N 08 21 181	E 076 58 320
16	22.01.2024	Kovalam	TVM Corporation	N 08 22 256	E 076 53 009
17	23.01.2024	Panathura	TVM Corporation	N 08 23 628	E 076 54 639
18	23.01.2024	Poonthura	TVM Corporation	N 08 23 925	E 076 53 114
19	23.01.2024	Poonthura	TVM Corporation	N 08 23 941	E 076 53 120
20	25.01.2024	cherithura	TVM Corporation	N 08 24 881	E 076 52 600
21	24.01.2024	Valiathura	TVM Corporation	N 08.26.878	E 07.52.825
22	24.01.2024	Valiathura Location 2	TVM Corporation	N 08.25.446	E 076.53.523
23	25.01.2024	kochuthope	TVM Corporation	N 08 27 603	E 076 53 048
24	03.02.2024	Vettukadu	TVM Corporation	N 08 27 612	E 076 50 568
25	03.02.2024	Kochuveli	TVM Corporation	N 08 27 679	E 076 50 617
26	05.02.2024	Sanghumughom	TVM Corporation	N 08 27 797	E 076 50 623
27	05.02.2024	Kannanathura	TVM Corporation	N 08 28 180	E 076 50 854
28	07.02.2024	Pallithura	TVM Corporation	N 08 32 286	E 076 50 825
29	07.02.2024	Pallithura	TVM Corporation	N 08 32 257	E 076 50 844
30	26.01.2024	valiyaveli	TVM Corporation	N 08.29.504	E 076 .50.135
31	26.01.2024	Thumba (Vettuthura)	Kadinamkulam	N 08 32 613	E 076 50 408

32	09.02.2024	Thumba (Vettuthura)	Kadinamkulam	N 08 32 676	E 076 50 407
33	27.01.2024	Puthenthoppu Location 1	Kadinamkulam	N 08 30 203	E 076 49 953
34	27.01.2024	Puthenthoppu Location 2	Kadinamkulam	N 08 30 246	E 076 49 962
35	30.01.2024	Vettiyathura	Kadinamkulam	N 08 29 850	E 076 48 586
36	28.01.2024	Mariyanadu Location 1	Kadinamkulam	N 08 35 064	E 076 47 862
37	28.01.2024	Mariyanadu Location 2	Kadinamkulam	N 08 35 079	E 076 47 826
38	30.01.2024	puthukurichi	Kadinamkulam	N 08 35 762	E 076 44 340
39	31.01.2024	Anchuthengu Location 1	Anchuthengu	N 08.35.457	E 076 39 624
40	31.01.2024	Anchuthengu Location 2	Anchuthengu	N 08.35.564	E 076.39.600
41	01.02.2024	Mampally Location 1	Anchuthengu	N 08.38.427	E 076 41 696
42	01.02.2024	Mampally Location 2	Anchuthengu	N 08.38.413	E 076.41.706

The deployment of 6,300 artificial reef modules off the coast of 42 fishing villages was successfully completed on 1st February 2024. This marked the culmination of a significant marine infrastructure initiative aimed at enhancing fish habitats and promoting sustainable fishing practices across the Thiruvananthapuram district. Each of these reef modules, carefully placed at specific underwater locations, is expected to serve as a long-term solution to increase fish populations and improve the livelihoods of the local fishing communities.

V. Project Monitoring and Evaluation

Following the successful deployment, the procedures for conducting an underwater study of the installed reef modules are currently halfway through. This comprehensive underwater study is being carried out to monitor the effectiveness of the reefs in fostering marine biodiversity, attracting fish populations, and assessing any potential environmental impacts. The study involves a detailed analysis of the condition and stability of the reef structures, as well as their contribution to the surrounding marine ecosystem. Once completed, the results will provide critical insights into the success of the project and inform future coastal protection and fisheries enhancement efforts.

The responsibility for monitoring and evaluating the performance of the deployed artificial reef modules has been entrusted to a dedicated Artificial Reef Sub-Committee. The sub-committee's role is to oversee the comprehensive assessment of the reef modules, ensuring that they effectively enhance fish habitats, promote biodiversity, and support sustainable fishing practices. Handholding with the Department of Fisheries, the sub-committee will carry out regular inspections, data collection, and underwater studies to evaluate the condition of the reef structures, their impact on the local marine environment, and their contribution to the livelihoods of the fishing communities. This ongoing monitoring process is essential for assessing the long-term success of the project and making informed decisions regarding future interventions or adjustments.

VI. Financial Outlay

An amount of Rs. 13.02 crore was sanctioned for the project with Rs. 7.812 crore central assistance and Rs. 5.208 crore state assistance.

An amount of **Rs. 1236.49211 lakh (Rupees Twelve crore thirty six lakh forty nine thousand two hundred and eleven only)** is expended for the deployment of 6300 reef modules of the coast of 42 fishing villages of the State. Utilization Certificate is attached along. An amount of Rs. 21 lakh is earmarked for future monitoring including underwater study, data collection, analysis etc.

VII. Conclusion

The successful deployment of 6,300 reef modules off the coast of 42 fishing villages in Kerala under the PMMSY scheme of the Government of India marks a significant achievement in enhancing coastal fisheries and promoting sustainable fishing practices. This initiative not only revitalizes marine ecosystems but also ensures long-term economic benefits for traditional fishing communities by boosting fish populations and increasing their catch. As a pioneering effort in marine resource management, it stands as a testament to the commitment of both the Central and State governments towards safeguarding livelihoods and the environment for future generations.