

A Report on the Marine Farming Initiatives at Madkai, a village adopted by Goa University under Unnat Bharat Abhiyan(UBA)

Madkai is a beautiful village, blessed with nature from all sides. Particularly, Aksan ward of Madkai village which is surrounded by Zuari estuary on one side and Khazan land and industrial estate on other side. Zuari estuary stretch that enters at Aksan ward makes the area ideal for the Mussel cultivation with the favourable salinity conditions. The sluice gate present controls the water levels during the tidal cycle thus replenishing the plankton stock and nutrients which are among the growth controlling factors. The existing mangrove forest with 3-5 species of mangrove plants adds to the organic matter in the surrounding waters. Variety of estuarine fishes, mangrove clams, oysters, sea slugs are found in this area, but no Green Mussels have been reported.

In Goa, mostly Mussels were/are in some places collected from the intertidal rocky zones. But the natural beds of Mussels are vanishing in the state. The demand for the Mussels increases in the market in which the tourism and hotel industry has a major role. There should be an alternate option for the large-scale production of the Mussels to meet the market demands. With this thought and having the ideal location for Mussel cultivation in Aksan ward, Dr. Lata Gawade (local resident of Aksan ward) initiated the mussels cultivation involving some of the ladies in the village, in 2014. Dr. Gawade trained the local ladies for Mussel cultivation. Now some of the ladies are experts in Mussel cultivation. Some of the villagers have realised the benefits of this project and have taken keen interest thus making the Mussel cultivation project in Madkai village a success story to inspire many more.

Mussel cultivation can be an alternate source of income, entrepreneurship, that will contribute to rural development to some extent. Mussel cultivation project has brought the change in terms of peoples thinking, to accept and practice new techniques for betterment. Apart from traditional agriculture practices, Mussel cultivation has added to their regular income, and they would like to take this venture at large scale as mentioned by one of the ladies involved in Mussel cultivation. They have realised the good profit benefits from the project which is almost 3-4 times of the expenditure with comparatively less laborious work involved.

In 2019, people could get the highest yield of Mussels with 20 times production of adult Mussels to that of the deployed spat initially. In 2021, Dr. Gawade initiated Oyster cultivation in Madkai village with the support from the Directorate of Unnat Bharat Abhiyaan (UBA), Goa University. In the year 2022, Marine farming sub-committee was formed under Social Entrepreneurship Swachhata and Rural Engagement Cell (SES-REC) of Goa University. More details of SES-REC can be found at <https://www.unigoa.ac.in/a/social-entrepreneurship-swachhata-and-rural-engagement-cell-sesrec.html> . Dr. Lata is the chairperson of the Marine Farming subcommittee and is looking forward to taking new ventures like seaweed cultivation. Such projects have a huge potential for income generation through self-employment and leading to entrepreneurship, that can boost the economy of the state to some extent. Goa University aspires to take a lead role in bringing this change through the Marine Farming Initiative.

Goa University has started the internship program on Marine Farming for Master's students and is looking forward to also start a certificate course in Marine farming. The first batch of internship students has done studies on Mussels and have generated good data on growth rate and biochemical content of the mussels and the impact of environmental parameters. It is observed that in four months' time, mussels have grown from average 4 cm to 10.5 cm in length. Also, there are plans to develop a Marine Farming Skill Development Centre that will contribute to training the locals for various Marine Farming Activities. Goa University is also looking forward for international collaborations to use and develop new techniques in the field for higher benefits. Dr. Gawade's proposal for Indo-German bilateral workshop has been approved and has received the grants from Indo-German Science and Technology Centre. The workshop will be conducted in Germany involving 30 experts in Marine Farming from India and Germany. The workshop deliberations may lead to an Indo-German Collaborative Project. Dr. Lata has also submitted a research proposal for an in-depth study of the Green Mussel Spat Generation process.

Some of the challenges faced during this project are - Getting mussels spat at the right time for deployment at the site to ensure good quality yield to increase the profit margin is a challenge currently faced which could be solved by having proper collaboration through the Fisheries department with the Mussel spat providers. Mussel cultivation in remote places has reported cases of theft of the ready to harvest Mussels from the deployment site which could be prevented by training and involving more villagers from the deployment site. Finding a good market price needs proper planning of Mussel Harvest time and then distribution in the right marketplaces for sale to maximize the profit.



