temperature for pearl growth is 27.1°C. Lustre or shine of pearls is also temperature dependant (lower the temperature, higher the lustre) (Le Moullac et al., 2018). Additionally, the Marine Heat Waves (MHWs) can cause damage of tissue in *P. maxima* (especially the gills' tissue) (Xu et al., 2022).

10.3 Importance of pearl farming in carbon sequestration and blue economy

Unlike some edible oysters, pearl oysters support ecosystem by providing services specifically through high filtration capacity. Water filtration capacity varies with size, life stage and species. Juvenile oysters can filter 2-4 litres of water per hour; adults can filter up to 22 litres and large *Pinctada margaritifera* and *Pinctada maxima* oysters have the capacity to filter 50~100 litres water per hour. Along with filtration, pearl faming also contributes to carbon sequestration and nutrient bio-extraction through shell formation. By extracting large quantities of organic nutrients and heavy metals, pearl oysters play a significant role in bioremediation (Farming, 2024).

11 Policy and Technology Transfer

The development of pearl cultivation in India is frequently dependent on the specific training, the sharing of technologies, and the localization. The Central Marine Fisheries Research Institute (CMFRI) and ICAR have played a key role in breeding, seed production, farming methods, training small-scale self-help groups to enhance quality and productivity at small and commercial levels (Jagadis et al., 2018).

Pearl culture has been transferred in India where the method has proved crucial in the transition to commercial application. It has now been possible due to the specialized training programs, on-field demonstration and participatory strategies whereby small farmers and rural self-help organizations have been able to integrate pearl production in their lives. The survival rates and the overall quality of pearls have improved due to diffusion of standard practices that include surgical implantation, pond and water quality management, and post-harvest value addition. Most importantly, such endeavors have shown that pearl farming can be an additional profitable activity to support the normal aquaculture and agriculture, and it can earn additional income. The report, however, notes that long-term sustainability would require uniform technical support, reliability in accessing the market, and sound policy support to encourage the wider adoption (Jagadis et al., 2018).

11.1 Pradhan Mantri Matsya Sampada Yojana (PMMSY)

It is a large initiative to modernize the fishing sector in India in a sustainable way. It was introduced in May 2020. The capital injection would be 20 crores of production, technological, and post-harvest infrastructure deficits over 5 years. The program empowers farmers and fishermen, promotes entrepreneurship and overall development of sectors through financial aid to the fish farming, fish hatchery, fish seeding, and capacity building programs.

11.2 NABARD's support for pearl culture

Cultivation of pearl is eligible to bank loans and NABARD refinance. The NABARD facilitates to qualified organizations such as Agriculture Development Finance Corporation (ADFC), State Cooperative Agriculture and Rural Development Bank (SCARDB), Regional Rural Banks and Commercial Banks to provide their loans on pearl culture facilities. The loan brings a maximum term of 15 years. The ultimate beneficiaries of the investment finance may be cooperative societies, firms, state or individuals and partnership firms (Sharma, 2005).

12 Future Aspects

In India, most farmers do not know much about the modern modes of aquaculture, such as pearl farming. Research and training institutions, especially ICAR-CIFA have eased the transfer of technology with farmers, entrepreneurs and women being trained. There are now freshwater pearl farms situated in states like Odisha, Maharashtra, Gujarat, West Bengal, Bihar, Uttar Pradesh, Chhattisgarh and Kerala. There is a large demand of big and designer pearls and even religious designs. The creation of more employment and more advanced methods of freshwater pearl farming can increase employment, wages and yielding high-quality freshwater pearls within a shorter cultivation cycle (Saurabh et al., 2022).

Indian government has provided subsidies and incentives to pearl farmers in order to reduce the financial risk associated with farming of pearl. Programs that are provided by different state fisheries departments differ. The