



Fostering Rural Aquapreneurs through Transforming Derelict Water Bodies into Aquaculture Pools

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ABSTRACT

The inaugural Census of Water Bodies undertaken by Ministry of Jal Shakti in 2018-19 identified 97.1% of staggering water bodies are situated in rural areas. Harnessing pisciculture in derelict water bodies presents a significant opportunity to bolster the rural economy. The amalgamation of the Ministry of Jal Shakti and Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) would pave the way for making this initiative feasible. By means of MGNREGS, revitalization of ponds and the preparatory measures for pisciculture can be carried out during the summer season; with onset of the monsoon in June, fishes can be introduced into the derelict water bodies. The utilization of derelict water bodies can further be improved through the integration of fish cum duck farming. A study conducted in Odisha has revealed a noteworthy benefit-cost ratio of 3.84 in a 1.24-hectare derelict water area. To promote this approach, awareness programs shall be implemented in rural areas through Krishi Vigyan Kendras (KVKs) and MGNREGS. With minimal investment and effective management practices, these derelict water bodies can be transformed into productive aquacultural ponds, fostering the emergence of a multitude of aquapreneurs and ultimately uplifting the economic status of rural communities.

KEYWORDS

Derelict water bodies, MGNREGS, Integrated farming, Aquapreneurs and Rural communities

Introduction

The inaugural Census of Water Bodies undertaken by Ministry of Jal Shakti in 2018-19 identified a staggering 24,24,540 water bodies across India. Astonishingly, 97.1% (23,55,055) of these water bodies are situated in rural areas, with a mere 2.9% (69,485) found in urban regions. Among these, 59.5% (14,42,993) of water bodies are ponds, followed by tanks (15.7%, i.e. 3,81,805), reservoirs (12.1%, i.e. 2,92,280), Water conservation schemes/percolation tanks/check dams (9.3%, i.e. 2,26,217), lakes (0.9%, i.e. 22,361) and others (2.5%, i.e. 58,884) (MoJS, DoWR, RD & GR, 2023). Unfortunately, a significant portion of these water bodies, approximately 16.3% (3,94,500) remains unused and neglected. Harnessing pisciculture in these unused and neglected derelict water bodies presents a significant opportunity to bolster the rural economy. This could be done by amalgamating the Ministry of Jal Shakti and Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) which would pave the way for making this initiative feasible.

Rehabilitating Derelict Water Bodies into Aquaculture pools

The initiatives conducted under the aegis of MGNREGS have indeed initiated the creation of water bodies for conservation and irrigation canals, including micro and minor irrigation projects. But these are often abandoned and left unused, serving solely as storage facilities. With proper utilization, minimal investment and effective management, these derelict water bodies can be transformed into profitable aquacultural pools. While there exist numerous methods for revitalizing these abandoned water bodies, one approach stands out as particularly effective is "integrated fish farming." The term "integrated fish farming" refers to a method of cultivating fishes in combination with several other agricultural/livestock crop cultivation centered just on fish ponds. Despite having several integrated fish farming methods fish cum duck farming is the most beneficial and profitable. Fish and duck cultivation sub-systems are interconnected in just such a manner that byproducts/waste of one sub-system provides important inputs to another sub-system and thus total utilization of farmland and water resources, contributing to greater as well as diverse farm production with minimal economic and labour input.



Fig 1: Revitalization of ponds through MGNREGS (Source: Asian News International, 2021)

Why Opt for Fish Cum Duck Farming?

A significant portion of the expenses in aquaculture is typically allocated to feed, pond fertilization, and aeration. Ducks, often referred to as "manuring machines," play a pivotal role in this regard. They contribute to pond fertilization through their droppings, reducing the need to purchase fertilizers and labour for manual application. Additionally, some fish species directly

consume these droppings as a source of nourishment. Also, ducks serve as natural biological aerators, enhancing water quality as they swim. Simultaneously, they benefit from their surroundings by consuming aquatic weeds, insects, and other invertebrates that could otherwise negatively impact fish culture. This harmonious relationship between ducks and the aquatic environment ultimately benefits both fish and ducks, offering a cost-effective and sustainable approach to aquaculture.



Fig 2: Integrated farming practiced in Bihar (Source: Author's own photo, 2023)

The Practical Approach

The journey towards converting neglected water bodies into thriving aquacultural pools begins with raising awareness about aquaculture within these derelict water bodies. This vital awareness training program can be orchestrated by a collaborative effort involving Krishi Vigyan Kendras (KVKs), non-governmental organizations (NGOs), local Fisheries Departments, and the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS).

The MGNREGS plays a pivotal role in this endeavor by engaging local individuals, regardless of their age or gender, in the creation of water conservation and harvesting structures. The work involved is unskilled, making it accessible to all. During the dry summer

months when pond water levels are at their lowest, various essential management practices come into play. These practices encompass the application of bleaching powder, partition construction, removal of aquatic weeds, implementation of nets to combat predatory and weed-infested fish, and the construction of duck houses.

As soon as the monsoon arrives and the ponds begin to fill with water, the Fisheries Department in each district will supply fish seeds to interested individuals, granting them certain concessions. Here conscious selection of fish species should be done. They should exhibit fast growth, diseases resistance, locally acceptable, low FCR, withstand changing physico-chemical and biological conditions of the pond water and reasonable market value. Fishes like Rohu (*Labeo rohita*), Catla (*Catla catla*),

Mrigal (*Cirrhinus mrigala*), Silver carp (*Hypophthalmichthys molitrix*), Common carp (*Cyprinus carpio*), Grass carp (*Ctenopharyngodon idella*), Tilapia (*Oreochromis mossambica*), Magur (*Clarias batrachus*), Java puthi (*Puntius javanicus*) Kurhi (*Labeo gonius*), etc. can be stocked. Fish seed of 10- 15 cm length (fingerling) is stocked at the rate of 4000-5000 nos. / ha. Fort nightly post stock management, fertilization of the pond is done. Conventionally fish feeding is done with rice bran and oil cake. Here feeding of fishes are made easy here as duck droppings are rich in nitrogen and phosphorus they fertilize the pond and supports the phytoplankton and zooplankton production. Some fishes directly take the duck droppings as feed.

Using locally available materials like bamboo or wood duck house is constructed on the pond embankment. Each duck requires 1 to 1.5 sq. feet space for their

comfortable stay. The height of the house should be around 2.5 m with well ventilation. The entry and exit of duck into the pond should be made easy for the ducks. Along the periphery of the fish farm there should be fencing to prevent the outgoing of the ducks from the fish farms. Three months old ducklings of Khaki Campbell and Indian runner are suitable breed of ducks because of their disease resistant, faster growth and high egg laying capacity. 200 to 300 ducklings are ample for a hectare pond.

In around six to seven months, the ducks and fish will reach table size. After the culture period, the fishes, ducks, and their eggs will be sold. Leasing out derelict water bodies to farmers in need who are interested in engaging in aquaculture would be one of the best options. Rs.4 lakh investment would give monetary benefits of Rs.6 lakh in one culture (6-7months) in one hectare.



Fig 3: Fish Harvesting in Gram Panchayat Tanks (Source: Odisha Diary Bureau,2019)

Challenges and Solutions:

1. Monsoon Uncertainties: In the backdrop of India's monsoonal climate, predicting rainfall accurately remains a challenge. However, by adopting flexible planning strategies and water management practices, aquaculture operations can be adapted to varying precipitation levels.

2. Poaching and Predation: Poaching and predatory fish species pose significant threats to aquaculture. Employing effective protective measures, such as netting and

vigilant monitoring, can help mitigate these risks and safeguard the aquatic assets.

3. Weedy Fish Infestations: Weedy fish species can disrupt aquaculture ecosystems. Implementing regular weed control measures, coupled with species selection that discourages weed growth, can help maintain a balanced aquatic environment.

4. Local Engagement: Local participation may fluctuate due to various factors. Addressing this issue requires community engagement and education programs to

underscore the economic and environmental benefits of aquaculture, encouraging greater local involvement.

While these challenges are indeed formidable, they can be successfully addressed through proactive pond maintenance, strategic awareness campaigns, and sustainable practices. By doing so, aquaculture endeavors can navigate these hurdles and flourish as catalysts for rural development.

Conclusion

The economic viability of transforming derelict water bodies into thriving aquaculture ventures is underscored by a favorable benefit-cost ratio of 3.82, as demonstrated in a 1.24-hectare pilot project in the coastal districts of Odisha. This approach promises not only financial gains but also stands as a catalyst for the comprehensive transformation of rural economies. Importantly, it is an inclusive endeavor, welcoming individuals of all genders and age groups into the fold of aquapreneurship. As this initiative gains momentum, it holds the promise of ushering in a wave of new aquapreneurs, invigorating rural communities, and charting a course towards robust rural economic growth.

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