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CONTENT INDEX

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FAITT

It is with great enthusiasm that I welcome you to the latest issue of *Aquafocus*, which continues to reflect the dynamic evolution and progressive vision of the aquaculture sector. This edition showcases the remarkable strides being made toward sustainability, productivity, and ecological stewardship through interdisciplinary innovation.

We explore varied and revolutionary aquaculture approaches in this issue. A new era of precision farming begins with aquaculture systems that use AI and IoT. These devices improve feed efficiency, water quality monitoring, labor, and environmental impact. Global and regional case studies show that smart aquaculture is becoming essential to robust and scalable fish production.

The revival of bacteriophage therapy as an antibiotic option in aquatic disease management is equally intriguing. Phages are a natural, highly targeted, and ecologically friendly way to fight bacterial infections like Vibrio spp., which could improve shrimp and fish farmed biosecurity as antibiotic resistance rises. The edition also examines seaweed aquaculture, a climate change option often overlooked. Seaweeds are effective in blue carbon sequestration, water purification, and methane mitigation. National institutes like ICAR-CMFRI and CSIR-CSMCRI have strategically promoted seaweed farming in India, highlighting its potential to enhance coastal livelihoods, bioproduct development, and ecological resilience.

This feature demonstrates how rainwater collection ponds can be used for small-scale aquaculture in Madhya Pradesh's Agri-Aqua Food System. This grassroots idea combines fish farming and water conservation to boost rural incomes and food security. It targets socio-cultural, educational, and infrastructural constraints through community participation, capacity building, and policy suggestions. Experimental research on live feed production, such as Moina culture on different feed substrates, gives practical insights. The findings help optimize live food supplies during early aquaculture species development..

This Aquafocus issue affirms our research, innovation, and community cooperation commitment to sustainable aquaculture. Smart sensors, phage therapy, and seaweed farming demonstrate the industry's endurance and adaptation in an uncertain environmental and economic climate.

Together, we can build an aquaculture future that is inclusive, sustainable, and poised to meet the nutritional needs of generations to come.

Warm regards,
Dr. A Jesu Arockiaraj
Editor-in-Chief
AQUAFOCUS Magazine

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Synergizing Rainwater Harvesting and Aquaculture for Sustainable Development in Behrawal Village, Shajapur, Madhya Pradesh

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Kalapipal block, located in Shajapur district of Madhya Pradesh, is a predominantly rural area known for its agricultural activities. The landscape is characterized by fertile land, with farming being the primary occupation of many residents. Key crops include wheat, maize, and various pulses. Kalapipal block has a population of approximately 75,000 to 80,000 people. The population is primarily rural, with a diverse demographic mix, including various communities and castes. In Kalapipal block, the cropping pattern is predominantly influenced by the local climate and soil types. The major crops grown in the area include Cereals: Wheat and maize are the primary cereal crops, Pulses, Oilseeds (mustard), Vegetables and fruits respectively.

The cropping pattern in Kalapipal reflects a combination of subsistence farming and market- oriented agriculture, with farmers adapting their practices based on seasonal changes and market demands. Crop rotation and intercropping are also common to maintain soil fertility and maximize yields. In Kalapipal block, water availability primarily depends on monsoon rains, which typically occur from June to September. The region's agriculture is closely linked to these seasonal rains.

Farm Ponds as source of water conservation

Benefits of Farm Ponds

Water availability can vary from year to year based on rainfall patterns, leading to challenges such as droughts or water scarcity during critical growing periods. This variability emphasizes the importance of efficient irrigation practices and water management in the region, due to the variability in rainfall patterns in Kalapipal block, many farmers have adopted farm ponds as a sustainable water management practice.

Rainwater Harvesting : Farm ponds capture and store rainwater, which can be used during dry spells, thereby reducing dependence on erratic rainfall.

Irrigation: Stored water can be used for irrigating crops, especially during the critical growing periods when rainfall is insufficient.

Soil Conservation: By retaining water in the landscape, farm ponds help prevent soil erosion and promote groundwater recharge.

Livestock Watering: Farm ponds allows farmers to regularly provide, water for their animals, which helps in ensuring their health and productivity.

Diverse Cropping: With better access to water, farmers can diversify their cropping patterns, growing a wider variety of crops and potentially increasing their income.

This study is based on primary data collection i.e. data were collected through field survey , interaction with the village sarpach, rural farmer communities of kalapipal block behrawal.

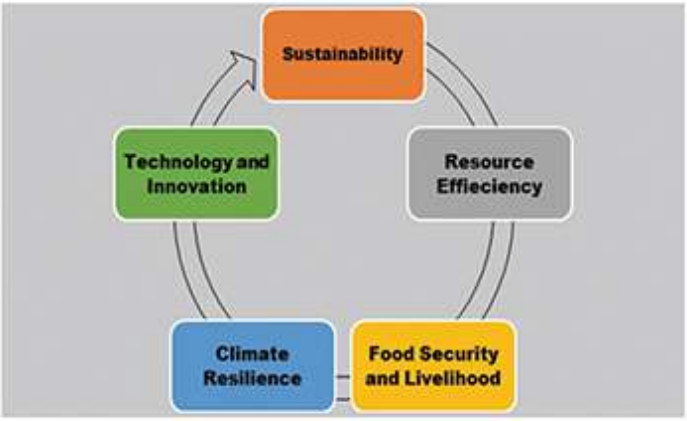
Rainwater Harvesting Ponds in Behrawal

Behrawal gram panchayat is a rural local body in Kalapipal block of the Shajapur district in Madhya Pradesh, India. This village has total 55 ponds in approx. 36.5 acre (1601500 sq feet) each 25 ponds have an area 22500sq feet each, 29 ponds 33500 sq feet, and 1 pond 67500 sq feet, and all these ponds established under various government schemes aimed at rainwater harvesting.

Primary Function: The main purpose of these ponds is to capture and store rainwater. This collected water serves as a critical resource for irrigation, particularly during the dry months when rainfall is scarce.

How can these Ponds be utilized apart from Agricultural Practices: So apart from the agricultural practices these ponds in Behrawal village can be utilized for fish farming which enhanced the agri-aqua food system in that area and also their overall utility and contributing to Community Development.

The **Aqua-Agrifood System** refers to the integration of **aquaculture** (the farming of aquatic organisms) with **agriculture** (the cultivation of plants and land-based livestock) to create a more sustainable, productive, and resilient food production system. This concept is of increasing importance as the global demand for food grows and climate change impacts agricultural productivity.



Why Aquaculture Practices are not Adopted there

Religious Constraints in the Region :

Due to religious beliefs, most villagers do not consume fish, so this is also the reason that aquaculture practices is not performed in that area.

Lack of Technical Knowledge :

There is limited technical knowledge and experience in aquaculture practices among the villagers. This lack of expertise affects the efficiency in aquaculture practices.

Agri-Aqua Food System

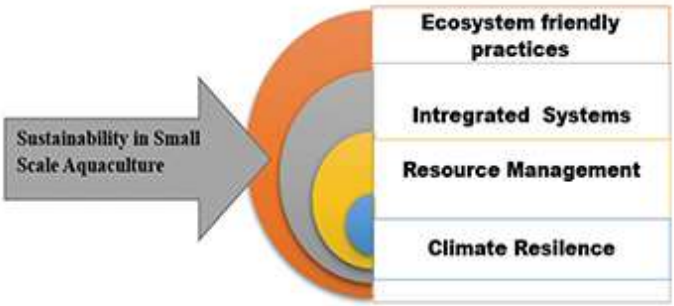
Utilizing ponds for Aquaculture- The practice of aquaculture has diversified income sources, enhancing financial stability within the community. Rainwater harvesting reduces reliance on groundwater and promotes sustainable water usage. The integration of aquaculture with irrigation reinforces sustainable Impact on Local Economy and Sustainability.

Income Generation and Economic Benefits: Despite from their religious views and local consumptions, this practice will increase the income of farmers without making extra efforts even resources is utilized which will create the double income of farmers. The practice of aquaculture has diversified income sources, enhancing financial stability within the community, even if fishes are sold outside the village.

Environmental Benefits: Rainwater harvesting reduces reliance on groundwater and promotes sustainable water usage. The integration of aquaculture with irrigation reinforces sustainable practices by optimizing the use of limited water.

It has been seen in preliminary survey that aquaculture practices were done in one or two ponds in Behrawal village, these people have doubled their income by fish farming. If the community will adopt aquaculture practices across all available ponds, it could significantly enhance local income levels, food security and promote small scale aquaculture production in Madhya Pradesh. Expanding these practices will optimize the use of water resources while providing a sustainable source of protein for the community and economic growth through increasing fish production and sales.

"Aquaculture practices where farming operations are modest in scale, typically characterized by low capital investment, labor-intensive practices, and the use of locally available resources. Small-scale aquaculture is usually aimed at providing food, income, and livelihood security to rural communities, rather than for large-scale commercial production." **(FAO)**



What we do in this Area

As a part of institutional responsibility, we propose to prepare a detailed action plan for aquaculture development in this area covering these farm ponds and other rural waterbodies. A proper documentation of this area will be done in a detailed manner by partnering with local people, local government, and NGOs for the effective management and development of aquaculture practices in Behrawal village, by which we will be facilitate better decision making and resource management.

Encouraging more villagers to adopt aquaculture could further enhance income levels and resource use efficiency.

Training and Resources: Providing training in aquaculture techniques This report underscores the value of combining traditional water harvesting methods with modern economic activities, serving as a blueprint for other rural areas seeking to balance resource management with income generation.

Fish farming has proved economically viable, contributing to food security and adding to the livelihoods of local farmers.

As Institutional responsibility we proposed to prepare a detailed action plan for aquaculture practices in these area-

Outline of Action Plan for Enhancing Aquaculture Practices in Behrawal Village

1. Documentation -

Documentation of a detailed record of a farm pond, i.e. Size, depth, water holding capacity, seasonality etc in this area.

2. Aptitude of Owner

The owner's understanding about the aquaculture practices is essential for success integration of aquaculture in farm ponds.

3.Conduct Training Workshops

Organize workshops to educate villagers on sustainable Best Aquaculture Practices could optimize fish yield and profitability.

4. Develop a Monitoring System

Establish a monitoring system to track pond health, water quality, fish growth, and harvesting practices.

5. Community Engagement Meetings

Facilitate regular community meetings to discuss findings from documented data, share experiences, and collaboratively identify challenges and solutions.

6. Diversification of Pond Use

Encourage the exploration of multiple uses for ponds, such as integrating livestock watering or creating recreational areas alongside aquaculture.

7. Documentation and Feedback Loop

Continue to document aquaculture practices and outcomes, creating a feedback loop that informs ongoing training and adjustments to practices.

8. Promote Ecological Awareness

Educate the community on the ecological benefits of diverse pond utilization, promoting sustainable practices that protect local biodiversity.

9. Evaluate and Adapt

Conduct regular evaluations of the implemented practices and adapt strategies based on performance, community feedback, and changing environmental conditions.

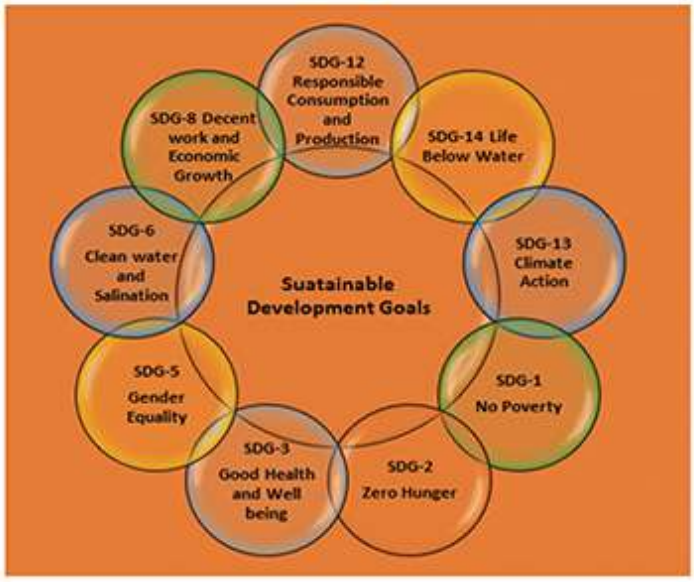
10.Replication in Similar Villages :

This model of dual-purpose ponds could be replicated in other villages facing similar water and economic challenges.

Conclusion :

This approach to water resource management through rainwater harvesting ponds is a model of sustainable development. By allocating these ponds for aquaculture, the village will successfully blend environmental stewardship with economic advancement. This practice not only ensures water availability for agriculture but also creates an additional revenue stream, benefiting the community and encouraging further adoption of sustainable practices.

The **Agri - Aqua Food System** is an innovative approach to sustainable food production that directly contributes to achieving multiple **Sustainable Development Goals (SDGs).**



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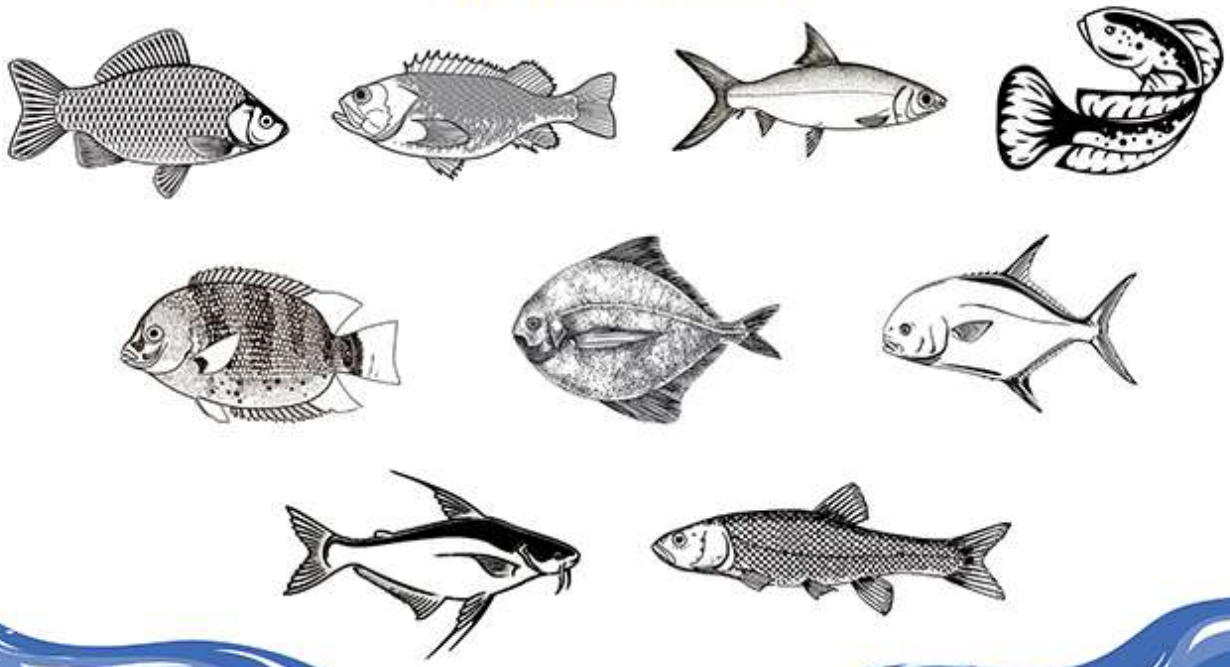

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Seaweed Fights Climate Change for Blue Carbon

Gopi V [1], Venkatesan N [2]

[1]Associate Project Manager, [2]Assistant Project Manager

[1 & 2] Foundation for Aquaculture Innovations and Technology Transfer (FAITT), Kumaran Kudil 4th Cross St., Thoraipakkam, Chennai, Tamilnadu

Introduction

When we think of climate heroes, our minds often go to trees. Forests get all the credit for absorbing carbon dioxide and cleaning our air. But there's an unsung climate warrior beneath the waves that's quietly soaking up carbon while doing a whole lot more **Seaweed**.

Yes, that slippery green stuff clinging to rocks at the beach or floating in your miso soup might just help save the planet.

What Is Blue Carbon?

We all know that plants on land absorb carbon dioxide (CO_2), but what's lesser known is that marine ecosystems also store carbon and often more efficiently. This is called blue carbon, and it includes carbon captured by oceanic habitats like mangroves, seagrasses, and seaweeds. Unlike trees, which store carbon for decades, seaweed can absorb carbon in just a matter of weeks. Some species of macroalgae grow up to half a meter per day, rapidly pulling CO_2 from the atmosphere through photosynthesis.

Farming the Future

Seaweeds are members of the kingdom *Thallophyta* and are ancient autotrophic organisms with a several kinds of life forms. They are multicellular or macro-algae that play a very important ecological roles in many aquatic communities and categorized into three types based on their pigment profile and characteristics: Chlorophyceae (green algae), Phaeophyceae (brown algae), and Rhodophyceae (red algae).

Globally, seaweed farming is booming. Countries like South Korea, Indonesia, and China have been cultivating seaweed for food, cosmetics, and industry for decades. Now, a growing number of startups and researchers are exploring seaweed farming as a carbon offset strategy.

Some projects aim to scale up seaweed farms to capture CO_2 and sink biomass into the deep ocean a concept still being studied for its long-term effectiveness and ecological impact.

Seaweed's Superpowers

Here's how seaweed earns its title as a blue carbon hero:

Rapid CO_2 Absorption : Seaweed acts like a sponge for atmospheric carbon. It grows fast and sequesters carbon at rates that rival or even exceed terrestrial forests.

Carbon Export: Some of the carbon captured by seaweed sinks to the ocean floor when the plant dies, potentially storing it for hundreds or even thousands of years.

No Need for Fertilizer or Fresh Water: Unlike land-based crops, seaweed doesn't need arable land, irrigation, or chemical fertilizers making it one of the most sustainable crops on Earth.

Ocean Cleanup: Seaweed also absorbs excess nutrients, such as nitrogen and phosphorus, helping reduce ocean dead zones and improving water quality.

Seaweed's Role in Livestock Methane Reduction

One unexpected benefit? Seaweed could cut methane emissions from livestock. When certain red seaweeds are added to cattle feed, studies have shown a reduction of methane emissions by over 80% a major breakthrough, since methane is 25 times more potent than CO_2 as a greenhouse gas.

Methane Emissions from Livestock:

Ruminant animals like cows and sheep produce methane during digestion through a process called enteric fermentation. This methane is released primarily through belching and is a potent greenhouse gas, significantly contributing to global warming.

Seaweed as a Feed Supplement :

Incorporating certain types of seaweed into livestock feed has emerged as a promising strategy to mitigate methane emissions. The red seaweed *Asparagopsis taxiformis* has been identified as particularly effective. Studies have

Rhodophyceae	Chlorophyceae	Phaeophyceae
Kappaphycus alvarezii	*Ulva reticulata*	*Ascophyllum nodosum*
Gracilaria edulis	*Ulva armoricana*	*Sargassum spp.*
Gelidium serrulatum	*Ulva Lactuca*	*Laminaria digitata*
Porphyra perforate	*Codium Liyengarii*	*Fucus vesiculosus*
Cyanidium caldarium	*Codium tomentosum*	*Durvillea antarctica*
Macrocystis pyrifera	*Caulerpa paspaloides*	*Ralfsia spp*
Nereocystis spp.	*Caulerpa sertularioides*	*Ecklonia maxima*
Acanthophora spicifera	*Enteromorpha prolifera*	*Hydroclathrus spp.*

Table 1. List of some important Seaweed species

demonstrated that adding small amounts of this seaweed to cattle feed can lead to substantial reductions in methane production.

So What's the Catch?

While seaweed shows massive promise, scaling it up isn't without challenges

Regulatory Uncertainty :

Many coastal areas lack policies or permits for ocean farming.

Environmental Impact:

Large-scale seaweed farms need careful management to avoid disrupting marine ecosystems.

Carbon Accounting :

It's still tricky to quantify and verify exactly how much carbon seaweed captures and stores long term.

A Green Wave Worth Watching

Still, seaweed is gaining serious momentum in the climate conversation. It's fast-growing, sustainable, versatile, and seriously underrated. From climate-smart farming to reducing methane burps from cows, seaweed is one of nature's most promising tools in the fight against climate change.

So next time you slurp some seaweed noodles or enjoy a sushi roll, take a moment to appreciate the blue carbon hero on your plate. The future of the planet might just be a little greener and a lot more marine.

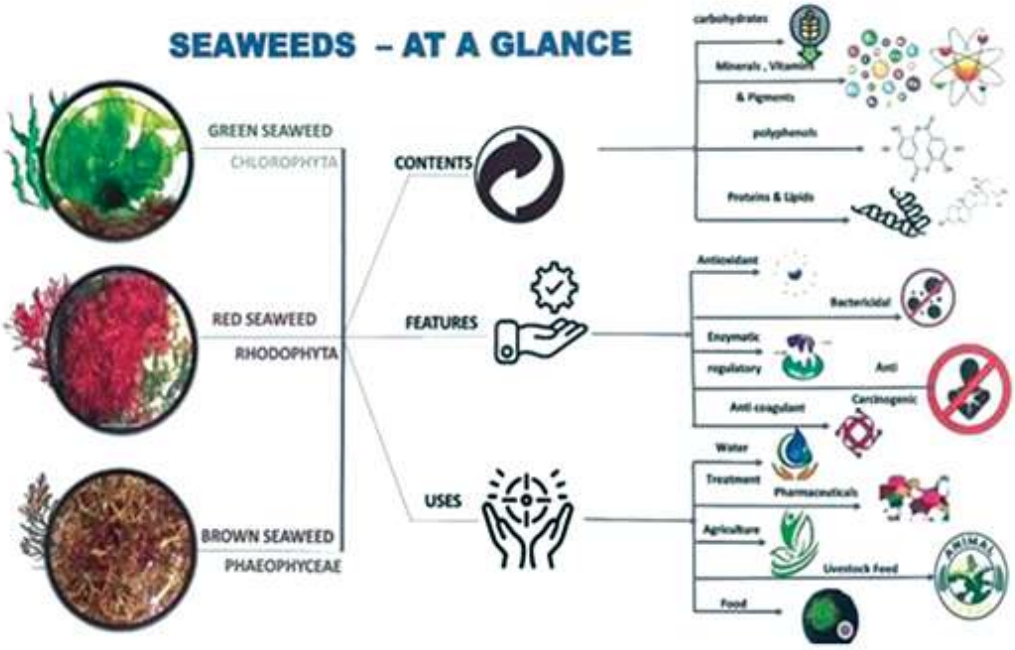


Fig. 1. Flow diagram of seaweeds at a glance

Seaweed research and training in India

The below central government institutions collectively advance seaweed research and cultivation in India, contributing to economic development, environmental sustainability, and the enhancement of coastal livelihoods.

Central Marine Fisheries Research Institute (CMFRI):

In September 2024, ICAR-CMFRI's Mandapam Regional Centre in Tamil Nadu was designated as a Centre of Excellence for seaweed cultivation. The centre aims to promote sustainable seaweed farming practices, address cultivation challenges, and enhance India's role in the global seaweed industry.

Central Salt and Marine Chemicals Research Institute (CSMCRI):

CSIR - CSMCRI's Marine Algal Research Station in Mandapam, Tamil Nadu, has been pivotal in developing seaweed cultivation techniques. The station has trained locals including many women, in modern seaweed farming techniques, significantly improving their livelihoods.

Central Institute of Fisheries Technology (CIFT):

ICAR-CIFT provides technological support for seaweed processing, contributing to the development of value-added seaweed products.

Centre for Marine Living Resources & Ecology (CMLRE):

Seaweed Research : CMLRE conducts studies on marine biodiversity, including seaweed ecosystems, and manages research vessels for extensive marine studies.

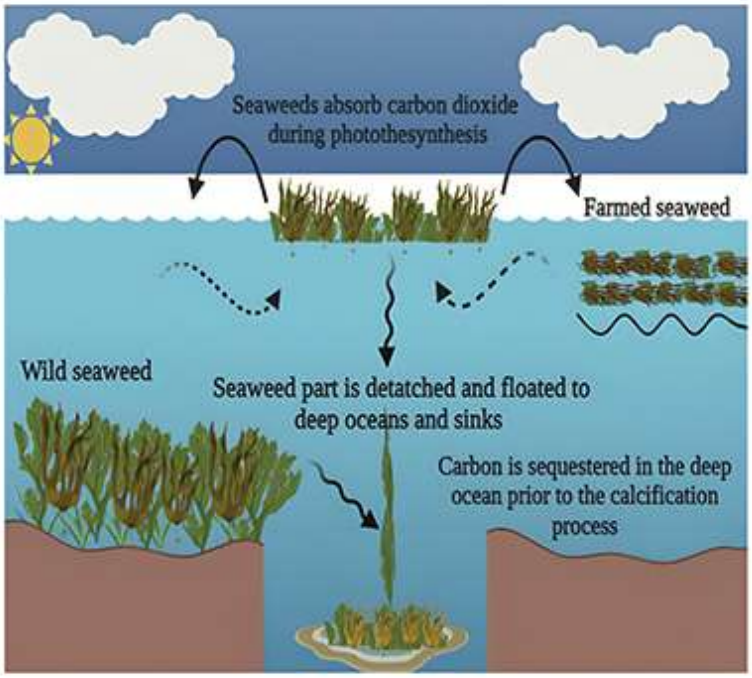
Central Institute of Brackishwater Aquaculture (CIBA):

ICAR-CIBA explores the potential of seaweed cultivation in brackishwater systems, aiming to enhance aquaculture sustainability.

Conclusion

In the global fight against climate change, solutions often seem complex, costly, or far off in the future. But seaweed offers something rare a natural, scalable, and surprisingly simple tool that's available right now. Whether it's drawing carbon from the atmosphere, cleaning our oceans, or slashing methane emissions from livestock, seaweed is proving to be more than just a fringe food trend.

Ongoing research and development are essential to address cultivation, economic, and regulatory challenges, aiming to make this solution both environmentally and commercially viable of course, no single solution will solve the climate crisis. But when we stack powerful innovations like seaweed farming alongside renewable energy, reforestation, and sustainable agriculture, we get closer to a truly resilient planet.



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CRESCO Objectives

CRESCO aims to cultivate and produce huge quantitative of Algae for Aquaculture Industry for use as Feed and Nutrition agent It aims for Mass production of Spirulina and value added products with an initial Target of 1Ton per month. Gradually it aims to develop large scale Algae ponds and be one of the largest producer of Spirulina – both for domestic consumption and also for International exports.

CRESCO and MICROALGAE Production

Cresco aims to produce large quantities of Algae and Microalgae. This would encompass production of economically important algal species like *Spirulina sp, Chlorella sp, Dunaliella sp, Hematococcus sp, Nanochloropsis sp, Diatoms, etc.* These are highly useful in the Aquaculture industry as Fish Nutrition.

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The Rise of Phage - Based Disease Control in Revolutionizing Aquaculture

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The Trouble Beneath the Surface

Aquaculture once hailed as the sustainable answer to the world's growing hunger for seafood is now facing a silent but deadly threat bacterial diseases. Fish and shrimp farms around the world lose billions of dollars each year to microbial infections that not only wipe out entire stocks but also force producers to rely on antibiotics just to survive. Vibriosis is one of the most common and economically significant bacterial diseases in aquaculture, caused by various species of the genus *Vibrio*. It affects a wide range of marine and brackish water organisms, including shrimp, fish, and mollusks.

But this heavy dependence on antibiotics has come at a steep cost. The rise of antibiotic-resistant bacteria is now threatening both aquatic life and human health. Pathogens like *Vibrio*, *Aeromonas*, and *Pseudomonas* have become increasingly difficult to control using traditional methods. Even worse, the excessive use of antibiotics leaves residues in seafood products and pollutes surrounding ecosystems. Just when the aquaculture industry seemed to be sinking under the weight of these issues, an old ally has resurfaced in a new light **bacteriophages therapy** or simply, **phages therapy**.

These naturally occurring viruses have been around for billions of years, silently preying on bacteria. Now, they're being enlisted as nature's precision tools to fight bacterial outbreaks in aquaculture, ushering in a new era of disease control.

Meet the Tiny Warriors

So, what exactly are phages?

Bacteriophages are viruses that infect and destroy specific types of bacteria, leaving other microbes unharmed. Unlike antibiotics, which indiscriminately kill both good and bad bacteria, phages act like guided missiles zeroing in only on their intended bacterial target.

This targeted approach is a game-changer for aquaculture. In shrimp hatcheries, for instance, where *Vibrio parahaemolyticus* and *Vibrio harveyi* were often wreaks havoc, phage treatments have been shown to reduce bacterial loads by up to 1,000 times. In fish farms, phages are being tested to combat common diseases like vibriosis with promising early results.

But it's not just about reducing disease. Phage therapy also contributes to environmental sustainability. Once a phage has eliminated its bacterial target, it naturally degrades leaving no harmful residues behind. It's as if nature built its own clean-up crew, tailored perfectly for the task.

Challenges and the Road Ahead

Despite the excitement, phage therapy in aquaculture is still in its early days. Several hurdles remain before it becomes a widespread solution.

Regulatory approval is one of the biggest barriers. Most countries still lack clear guidelines for using phage products in food systems, although this is beginning to change as governments recognize the urgency of antibiotic resistance.

Another challenge is the evolutionary arms race between bacteria and phages. Just as bacteria can become resistant to antibiotics, they can also develop resistance to phages. However, researchers are combating this by creating **phage cocktails** combinations of multiple phages that target the same bacteria in different ways, reducing the chance of resistance.

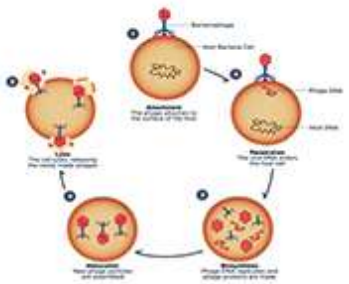

Fig 1. Phage action on Targeted Bacteria

Vibrio Species	Common Hosts	Disease Name / Syndrome	Key Symptoms
Vibrio harveyi	Shrimp, Groupers, Seabass	Luminous Vibriosis	Muscle necrosis, lethargy, glowing water, ulcers
Vibrio alginolyticus	Shrimp, Groupers, Seabream, Seabass	Tail Rot / Ulcerative Disease	Tail/fin erosion, red body parts, cloudy eyes
Vibrio parahaemolyticus	Shrimp	AHPND / EMS (Early Mortality Syndrome)	Hepatopancreas atrophy, lethargy, sloughing, high early mortality
Vibrio vulnificus	Fish (e.g., eels), Humans (zoonotic risk)	Hemorrhagic Septicemia	Ulcers, abdominal swelling, internal bleeding
Vibrio anguillarum	Marine Fish (Salmonids, Seabass)		

Table 1 : Types of Vibriosis in Aquaculture Ponds : Pathogens, Hosts, and Symptoms

A Viral Revolution

In a world desperate for sustainable solutions, phage therapy offers something rare: a method that is scientific, natural, and scalable. These microscopic viruses are redefining how we think about disease control not just in aquaculture, but potentially across all of agriculture and medicine.

As phages rise from obscurity to become frontline defenders of aquatic health, they bring with them the promise of a cleaner, healthier, and more resilient future for seafood.

Benefits

- Effective against Vibriosis, other Bacterial Infections.
- Effective in preventing Gut Infections and Feed improvement.
- Prevents sudden crop loss in pond
- Works as an alternative to antibiotics

Application

Finally, there's the matter of application. Should phages be added to feed? Sprayed into water? Injected? Different species, life stages, and diseases require different delivery strategies making continued research and field trials essential.

Still, the momentum is unmistakable. Startups and research labs around the world are racing to develop phage-based solutions, and some commercial products have already hit the market. With rising consumer demand for antibiotic-free seafood, the incentive for adoption is stronger than ever.

During mild to moderate symptoms of Vibriosis, a treatment regime recommended is pond application to hit the causative bacteria by more phage therapy approach and get faster results, thereby saving the fishes/shrimps. The Vibrio phages can be used in both growout ponds and hatcheries to control the Vibriosis infection.

Conclusion

As the aquaculture industry races to meet global seafood demand, the emergence of phage therapy marks a pivotal moment in disease management. With their precision, eco-friendliness, and adaptability, bacteriophages offer a natural solution to combat antibiotic-resistant pathogens and promote healthier aquatic systems. While challenges in regulation, formulation, and large-scale deployment remain, ongoing research and innovation are rapidly paving the way for phages to become mainstream tools in sustainable aquaculture. By embracing this microscopic ally, we not only safeguard aquatic livestock but also move one step closer to a resilient, antibiotic-free blue revolution.

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Why Prawns are a Nutritional Powerhouse :

5 Key Benefits

1. High-Quality Protein

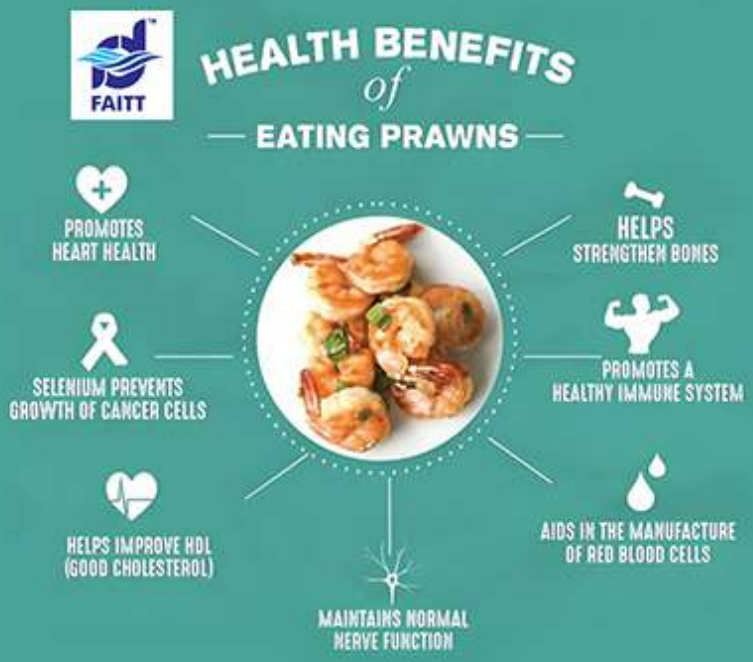
Both Prawn and shrimp are excellent sources of lean protein, essential for muscle repair and overall body function. A 100g serving provides approximately 20 grams of protein.

2. Rich in Omega-3 Fatty Acids

They contain significant amounts of omega-3 fatty acids, which are known to reduce inflammation, lower blood pressure, and decrease the risk of heart disease.

3. Low in Calories and Fat

Prawn and shrimp are low in calories and saturated fat, making them suitable for weight management and heart health. A 100g serving contains approximately 76 calories.



4. Packed with Essential Vitamins and Minerals

They are rich in vitamins B12 and E, selenium, iodine and zinc, all of which support immune function, thyroid health, and antioxidant defenses.

5. Contains Antioxidants

The presence of astaxanthin, a powerful antioxidant found in this seafood, contributes to skin health and may reduce the risk of certain chronic diseases.

Culinary Uses

Prawn and shrimp are versatile ingredients in various cuisines. They can be grilled, boiled, sautéed, or incorporated into dishes like curries, salads, and pastas. Their quick cooking time and ability to absorb flavours make them favourites in many recipes.

Incorporating Prawn and shrimp into your diet can provide numerous health benefits, from supporting heart health to supplying essential nutrients.

Department Of Fisheries
& Fishermen welfare
Government of Tamil Nadu

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The State of Tamil Nadu with its rich heritage from Sangam era is blessed with Marine, Brackish water and Inland fishery resources amenable for capture and culture fisheries with a total fish production of 7.57 lakh tonnes. Fisheries sector plays an important role in the socio-economic development of the State by providing livelihood to large number of fishers, generating employment opportunities in allied sectors, fetching foreign exchange through seafood exports and ensuring nutritional security.

SEAFOOD, PRAWNS in particular, is advocated as a protein rich nutrient packed healthy food suitable for children to aged persons. The presence of healthy Omega 3 fatty acid, Iodine, Minerals, Vitamins A D & K and trace elements with easy digestibility and superb taste makes Seafood an international delicacy.

CHENNAI SEAFOOD SHOW & PRAWN FEST 2025

scheduled from 30th May to June 1st 2025, is a platform to popularise the health and nutritional benefits of Seafood with particular emphasis on Prawn consumption.

CHENNAI SEAFOOD SHOW 2025

is a new flagship initiative of Department of Fisheries in association with the Coastal Aquaculture Sector which is aimed at promoting domestic consumption of Seafood especially Prawns through awareness creation to accelerate investments and growth in the Fisheries and Aquaculture sector in the State of Tamil Nadu.

It is proposed to showcase the best possible seafood products with special emphasis on Prawn, its recipes, demonstration by acclaimed Chefs, interactive sessions with Doctors and Nutritionists and a display of aquariums to satisfy the thirst of every visitor. Cooking competitions are also organised for Catering College Students, Fisherwomen and others.

THEME OF THE YEAR : PRAWN FEST

(Awareness on Prawn)

PRAWN FEST 2025 is an ecstatic celebration for the consumers to learn, taste and relish various delicacies of Prawn varieties in Live Food Courts, with "Ready to Cook" and "Ready to Eat" mouth-watering products, best seafood cuisines, value added fishery products, participated by over 25 popular Sea Food caterers under one roof.

More than 100 Recipes of PRAWN DISHES are served to taste. Interactive sessions with Doctors & Nutritionists to dispel the myths related to Prawns consumption.

HIGHLIGHTS OF THE EVENT

- Aquarium – Fish Keeping as Hobby & Sale of Accessories
- Exhibits by more than 50 Seafood Companies
- Awareness of SEAFOOD & PRAWN Consumption
- Health Benefits of PRAWN
- 3 Days Live Food Court - 25 Stalls
- LIVE Demonstration by Leading CHEFS (PRAWN FOOD RECIPE)
- Cooking Competition : Catering College Students & Fisher women
- Fun and Entertainment etc.,
- Prawnathon - A mini marathon to promote the consumption of Prawns

EXHIBIT PROFILE

AQUARIUMS

- Ornamental fish live display
- Sales counters for all accessories

FISHERIES & AQUACULTURE

- Aqauculture Companies
- Prawn Farms
- Prawn Hatcheries
- Aquaculture Technology and Equipment Providers
- Feed and Nutrition Suppliers

SEAFOOD PROCESSING AND PACKAGING

- Innovations in Seafood Processing
- Packaging Machinery and Equipment , Materials
- Fisheries Processing Equipment Manufacturers

COLD STORAGE AND LOGISTICS

- Cold Storage Facilities & Cold Chain Logistics & Management Companies
- Quality Control
- Refrigeration and Freezing Technology

HYGIENE SOLUTIONS

- Sanitation Products - Providers of cleaners and sanitizers for seafood handling safety.
- Food Safety Compliance Consultants - Consulting services for regulatory requirements

ENVIRONMENTAL SOLUTIONS

- Waste Management - effective disposal and recycling services for seafood processing waste
- Water Treatment Providers - Seafood processing and Aquaculture

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Unlocking the Health Secrets of Prawns : Top 5 Benefits

Indulging in grilled, steamed, or drunken prawns has got to be one of the best ways to enjoy fresh seafood in Singapore. Considered one of the healthiest foods in the world, prawns are an excellent source of complete protein, meaning it includes all nine amino acids necessary for the body to maintain health and function.

Way lower in calories than chicken or beef, prawns deliver the same amount of protein as red meat or poultry.

Medical professionals and nutritionists often recommend eating crustaceans and shellfish as part of a healthy diet. Here are 5 lesser-known health benefits of prawns that make them shrimply the best!

1. Helps With Weight Loss

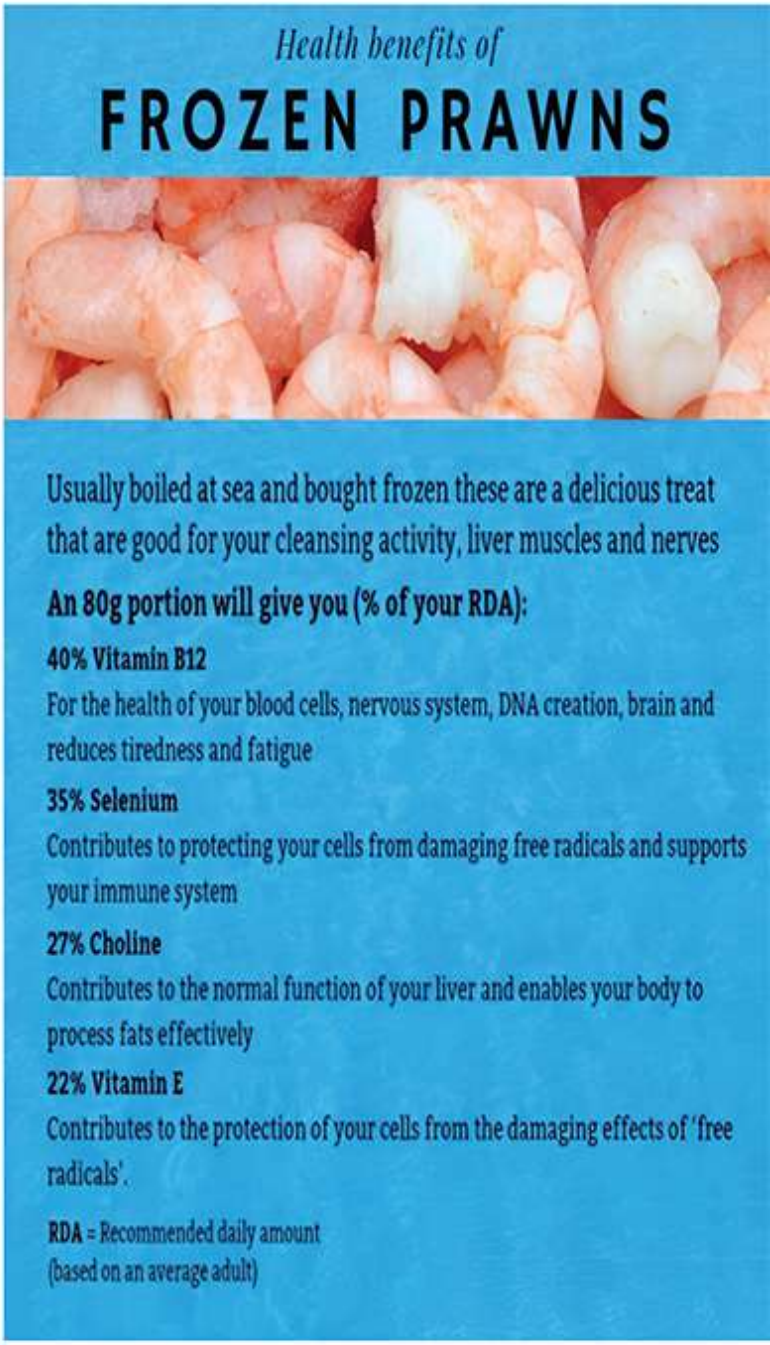
Prawns are loaded with protein yet low in saturated fat. Similar to chicken and beef, 100 grams of prawns contain about 25 grams of protein. However, 100 grams of prawn only has 115 calories, compared to about double that for chicken and triple that for beef.

Prawns also contain high levels of zinc, an essential mineral in maintaining a healthy immune system. Zinc is directly associated with leptin, a hormone that regulates appetite and fat storage. To add the cherry on top, prawns have high levels of iodine, a mineral that controls thyroid hormones and boosts metabolism. All in all, if you're trying to lose weight, prawns are a great addition to your diet.

2. A Rich Source of Vitamins & Minerals

These little crustaceans are jam-packed with essential vitamins and minerals. 100 grams of prawns contain:

- 11% of your recommended daily intake (RDI) for calcium
- About 15% RDI for iron
- 33% RDI for phosphorus
- 9% RDI for potassium
- About 20% RDI for zinc
- About 25% RDI for selenium



The high levels of vitamin B6, B12 and niacin all work together to help increase energy, put on lean muscle and replenish red blood cells.

3. Builds Strong Muscles & Bones

The generous amount of selenium found in prawns will improve bone strength and durability. Selenium is a powerful antioxidant that strengthens teeth, hair and nails, all while fighting free radicals in the body.

Other minerals like calcium, zinc, and phosphorus contribute to building and maintaining strong bones.

In addition, protein is a vital mineral in building muscle with amino acids helping to repair and maintain muscle tissue. A single serving of 100 grams of prawns will deliver about half the recommended daily protein intake. So, if you're aiming for a toned, muscular body, swapping out protein shakes and chicken breast for prawns once in a while will do you good!

4. Promotes Heart Health

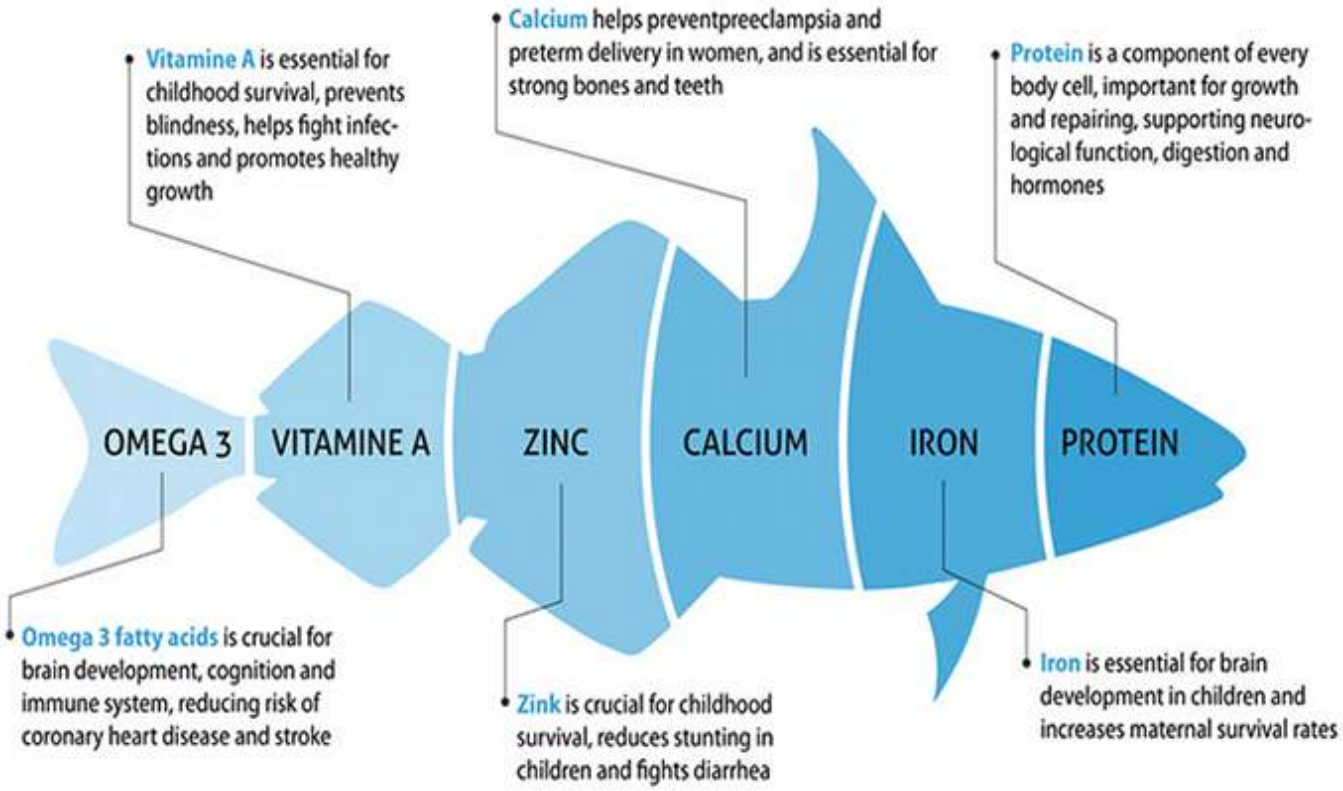
Prawns contain high levels of Omega 3 fatty acids, a well-known nutrient long credited with lowering blood pressure, reducing the risk of heart attacks and contributing to a healthy cardiovascular system.

They are also an excellent energy source and keep the organs, blood vessels and immune system functioning.

5. Potentially Prevents Cancer

We get free radicals from certain sources like industrial chemicals, cigarette smoke, alcohol, and air pollutants. They are almost impossible to avoid, and stay in our bodies. Rich in powerful antioxidants like selenium and vitamin E, prawns can help protect cells from damage and stave off serious diseases. Selenium is also believed to prevent tumour growth and strengthen the immune system.

Get Your Fill of Delicious Prawns at Chennai Seafood Show and Prawn Fest 2025



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Shrimp-a-thon 2025: An initiative to raise domestic shrimp consumption in India

Bhavana Reddy, Strategic Marketing Lead, Skretting India

Shrimp-a-thon 2025 concluded successfully marking a significant step in promoting domestic shrimp consumption and highlighted shrimp's role in nutrition and India's aquaculture sector. Held in the heart of India's aquaculture belt Bhimavaram, Andhra Pradesh on May 4, 2025 the event brought together a diverse group of over 500 participants, including farmers, dealers, fisheries students, health professionals, chefs, policymakers, opinion makers and educators showcased the importance of supporting local shrimp consumption and embracing a healthier lifestyle through **# Shrimp For Health** campaign.

The morning kicked off with energizing 3km and 5km runs, which saw strong participation and high spirits. The run symbolized a collective stride toward nutritional awareness, sustainable food choices and a stronger domestic aquaculture ecosystem.Event concluded with delicious shrimps dishes sponsored by farmers turning the experience into a celebration of both health and locally produced superfood.

The event highlighted a critical paradox: while India is one of the world's leading shrimp producers, more than 90% of its shrimp is exported, even as protein deficiency continues to affect a large portion of the population. This became the central theme of the event emphasizing the urgent need to bridge the gap between production and consumption locally.

Dr. Saurabh Shekhar, General Manager, Nutreco South Asia, addressed the audience and debunked common myths surrounding shrimp consumption. He emphasized shrimp's nutritional profile high-quality protein, low fat, and essential micronutrients and stressed its potential to become a mainstream protein source for Indian households. Initiatives like this acts as a trigger for a sustained, concentrated effort to build long-term awareness and boost domestic consumption.

Mr. Ravi Kumar Yellanki, President of the All India Shrimp Hatcheries Association, cited the opportunity to grow local consumption, comparing India's potential to China's 25-fold growth in 15 years. **Dr. Manoj Sharma** of Zhingalala emphasized shrimp's nutritional value and supported efforts to promote locally produced protein. Chandrasekar S of USSEC and Right To Protein aid shrimp is important to India's economy and protein goals.

Beyond the run, the event featured interactive stalls such as the Protein-o-Meter and Live Shrimp Counter, enriching the experience. It not only positioned shrimp as a powerful superfood but also showcased the strength of collaboration within the aquaculture industry.

A collective effort: Thanks to our valued co-sponsors

The success of Shrimp-A-Thon 2025 was made possible by the strong support of more than 17 co-sponsors and partners, all integral to the aquaculture value chain. United by a common goal, we worked together to promote a healthier, protein-rich India and a more sustainable aquaculture industry. Their commitment to the cause played a vital role in making the event a remarkable success.

A strong foundation for the future

Shrimp-A-Thon 2025 was more than just a run it was a powerful initiative to change perceptions, encourage local shrimp consumption, and create a lasting impact. With exceptional participation and collective support, this initiative has set a strong foundation for future campaigns focused on raising awareness about domestic shrimp, enhancing food security for sustainably **feeding the future.**

As we move forward, the momentum created here will continue to build bridges between **producers and consumers,** inspire more informed dietary choices, and strengthen India's position as not just a leading shrimp exporter but also a nation that values and consumes what it grows.

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Smart Aquaculture : How Artificial Intelligence (AI) and IoT (Internet of Things) are Transforming Aquafarming

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Introduction

In the face of growing global demand for seafood, the aquaculture industry is undergoing a high-tech revolution. Gone are the days when fish farming relied solely on human observation, manual feeding, and trial-and-error practices. Today, Artificial Intelligence (AI) and the Internet of Things (IoT) are reshaping the way fish are raised, monitored, and harvested making aquaculture more efficient, sustainable, and resilient than ever before.

Aquaculture, the farming of aquatic animals like fish, shrimp has become one of the fastest-growing food sectors in the world. However, traditional fish farming faces challenges like disease outbreaks, feed inefficiencies, water pollution, and unpredictable environmental conditions. These problems cost farmers billions each year in lost yields and degraded ecosystems.

Smart aquaculture a new era where interconnected sensors, real-time data, and intelligent systems provide fish farmers with unprecedented control and insights.

IoT: The Farm's Sensory System

At the core of smart aquaculture is the IoT a network of sensors and devices embedded in ponds, tanks, or cages. These devices monitor crucial parameters such as water temperature, pH, dissolved oxygen, ammonia levels, and turbidity, transmitting this data continuously to a central system.

For instance, if dissolved oxygen levels drop suddenly a common cause of fish mortality. IoT devices can automatically trigger aerators to restore balance. This real-time responsiveness prevents losses and ensures optimal conditions 24/7, even in remote or offshore locations.
Additionally, underwater cameras and sonar sensors track fish movement, size, and behavior, allowing farmers to better understand feeding patterns and health status without disturbing the stock.

AI: The Brain Behind the Operation

All the date generated from IoT wouldn't be much use without AI to interpret it. AI algorithms analyze sensor data to detect patterns, predict risks, and recommend actions. For example, machine learning models can forecast disease outbreaks by recognizing early behavioral signs or environmental triggers. They can also optimize feeding schedules based on fish appetite, size, and growth rates reducing waste and saving costs.

Smart feeders, guided by AI, dispense the exact amount of feed required, reducing overfeeding, one of the leading contributors to water pollution in aquaculture systems. AI-driven systems can also calculate the best harvest time, maximizing yield and market value.

In offshore cage systems, AI combined with computer vision can even identify individual fish, track growth rates, and detect injuries or parasites, offering a level of precision farming previously unimaginable.

Sustainability Meets Profitability

One of the most compelling aspects of smart aquaculture is its ability to make the industry more sustainable. By minimizing feed waste, improving animal welfare, and reducing disease outbreaks, these technologies help lower the environmental footprint of fish farming.

At the same time, automation reduces the reliance on manual labour and human error, enabling scalable operations that are both economically viable and environmentally responsible.

Real-World Success Stories

Countries like Norway, Chile, and China are already seeing results. Norwegian salmon farms use underwater drones and AI to inspect nets and monitor fish health, while Chinese tilapia farms have installed solar-powered IoT stations that monitor and regulate pond conditions remotely.

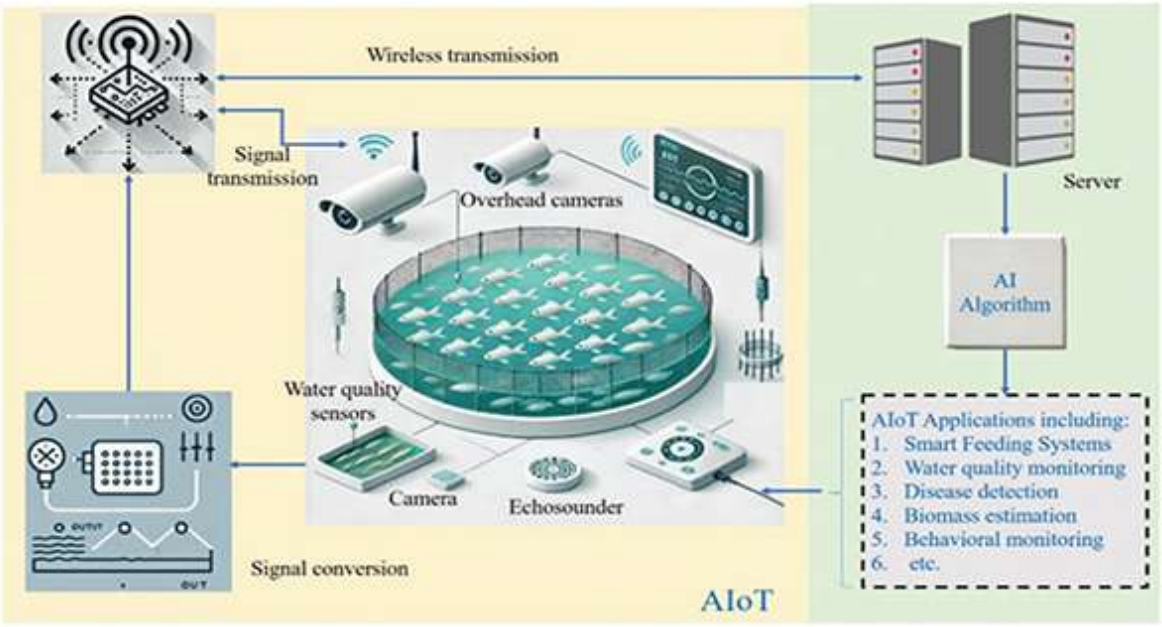

Figure: Schematic representation of AI and IoT in smart aquaculture

Even in regions with limited infrastructure, affordable sensor kits and cloud-based platforms are making smart aquaculture accessible to small-scale farmers, democratizing innovation in the blue economy.

The Road Ahead

Smart aquaculture isn't just about deploying high-tech gadgets. It is about rethinking how we produce food from our oceans and freshwater ecosystems. It marks a paradigm shift from reactive, manual practices to proactive, data-driven stewardship, where every drop of water and every gram of feed is optimized for maximum efficiency and minimal impact.

This movement reflects the powerful convergence of biology, technology, and sustainability. By integrating Artificial Intelligence (AI) and the Internet of Things (IoT), aquaculture is evolving into a system that is not only more predictable and productive, but also more eco-conscious and resilient.

As these technologies become more accessible and affordable, their adoption will accelerate empowering farms of all sizes to harness intelligent, connected, and responsive tools. The future of fish farming lies in systems that can meet global food demands while restoring balance with nature.

While promising, smart aquaculture still faces challenges:

- Advanced sensors and AI systems may be unaffordable for smallholders without subsidies.
- Remote areas may lack internet or power infrastructure.
- Ownership and security of farm data need clear regulations.
- Farmers require training to operate and interpret smart systems.

By investing in these technologies today, we pave the way for a blue economy that benefits farmers, consumers, and the planet alike.

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Countries such as USA, Canada, UK, Iceland,Malaysia & Portugal have had the privilege of hosting this unique congress. In the year 2026, the World Seafood Congress will come to India for the first time and PDA Ventures Private Limited a Bangalore based Professional Trade Show & Conference organising company has been chosen to host the WORLD SEAFOOD CONGRESS 2026 in India.

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Use of Different Feed Analaysis Growth and Survival of Moina

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Introduction :-

Moina are a type of freshwater zooplankton that can also be used as a live food source because they are nutritious and ideal for feeding small fish, fry, and crustacean larvae. Moina are also one of the easiest live foods to culture at home in small containers. With a basic setup and proper care, aquarists can produce a regular supply of Moina to feed out to their fish.

As I have already said, Moina are rich in high-quality proteins, beneficial lipids, vitamins, and minerals. It supports growth, health, coloration, and development in aquarium fish.

Additionally, their soft bodies are also easily digested by fry, which allows efficient absorption of the nutrients. All in all, it makes Moina an excellent live food choice even compared to other great live feeds such as Rotifer and Artemia.

Objective:-

To evaluate growth and survival of MOINA at using of different type of feed.

MATERIALS AND METHODS

TOPIC : USE OF DIFFERENT FEED ANALAYSIS GROUTH AND SURVAIVAL MOINA

- **Experimental Location:** The experiment was carried out in the Wet laboratory of College of Fisheries, Shirgaon, Ratnagiri.
- **Materials**
- **Experimental zooplankton**

MOINA Size 0.008 – 0.02 inch (0.2 – 0.5 mm)

Shape : The body is oval-shaped and moderately compressed laterally. The head is fused with the body.

Experimental Containers : Circular plastic tank 100 Liter capacity were used for this experiment.

Feed :

1) GOC

2) YEAST

❖ Aeration:

An air pump was used for providing aeration to two experimental tube . The aeration tubes were placed in each tub with sinkers attached at the end of tubes.

Ground nut oil cake

Dry yeast

Culture tank

Moina

Wet laboratory

Collecting the Moina outside:
in mirakarwada jettyare a small amount.

Prepare the tank :

The taking the 100 L capacity but for the experiment there are the taking 2 tub filling the water 100L water in the 2 tub and maintaining the pH and temperature and 5000 inoculum are use in each tank

Install aeration: set up an pump to provide gentle aeration this help keep the water oxygenated.

Feeding :
The Moina were fed at the rate of 50 – 200 % BW/day. The feed was offered twice a day.

Maintenance of Temperature and pH: A reservoir tank, in which water of 7-8.5 pH range was prepared. maintain the temperature 21 - 27 °c

moina inoculam collecting

moina

100 l. tank

WATER QUALITY PARAMETERS :-

- **pH :** They prefer a pH between 7-8.5, with optimal growth around 7.5-8. Moina do not like acidic water. Therefore, if you have such water you will need to use alkaline buffers .
- **Temperature :** Some species of Moina are resistant to extremes in temperature and easily tolerate variations from 41–88°F (5–31°C). Nonetheless, the ideal temperature range is 70-85°F (21-29°C). Cooler temperatures below 60°F (15°C) slow reproduction. Heat above 90°F (32°C) shortens lifespan.
- **Oxygen** : Some aquarists do not use it since Moina require very little oxygen. At the same time, experiments showed that by keeping food particles in suspension, we increase phytoplankton production. As a result, females produce more eggs. So, it is highly recommended to set up an air pump to provide gentle aeration.
- **Salinity :** Moina do best at salinity zero ppt According to the study, the survival rate of Moina macrocopa at salinity 15 ppt was approximately 20%.

  Note: Moina are extremely sensitive.

Water temperature

pH Test

FEEDING :-

The for the moina using the tow type of feed supernatant fertilized Yeast and the Groundnut Oil Cake (GOC) and they feeding to the moina in a day two time morning 9:30 and evening 5:30.

The Moina eat between 50-200% of their body weight in food particles daily. So, feed the culture small amounts of powdered food every day.

Maintenance of Moina Culture :-

- Keep your water warm. Moina will reproduce quickly in warm water.
- Check culture density daily. They slow down reproduction in high densities.
- Siphon out any uneaten food accumulations at the bottom to prevent fouling.
- Keep notes on feeding schedules and responses to refine the diet and culturing methods.
- Control nitrates and It is believed that high concentrations are the main cause why the culture can crash. Do small water changes.
- Always have backups. Ideally, you need to have 3-4 cultures at the same time.
- If you see that they stop not reproducing well, the culture should be completely harvested and a new culture started.

Harvesting :-

- First harvesting the with help of the plankton net moina are the harvesting tank one and tank two the 1st harvesting done 18 jul 2024 feeding the angel fishes and some inoculam releasing in pond number 1.

Tank number1 (yeast)	**Harvesting : 2,80,000**	**Restoking : 50,000**
Tank 2(GOC)	**Harvesting : 120,000**	**Restoking : 50,000**

Second Harvesting : -

The 2nd harvesting was done 20 jul 2024,with the help of plankton net harvesting the moina zooplankton , feeding the angel fishes and some inoculam releasing in pond no.1.

Tank number1 (yeast)	**Harvesting : 3,00,000 no.moina**	**Restoking : 50,000 no.moina**
Tank 2 (GOC)	**Harvesting : 1,75,000 no.moina**	**Restoking : 50,000**

Third Harvesting : -

The 3rd harvesting was done 24 july 2024 with the help of plankton net harvesting the moina zooplankton , feeding the angel fishes and some inoculum releasing in pond no.1

Tank 1 : (yeast)	**Harvesting : 1,16000 no. moina**	**Restoking : 15,000**
Tank 2 (GOC)	**Harvesting : 84000**	**Restoking : 10000**

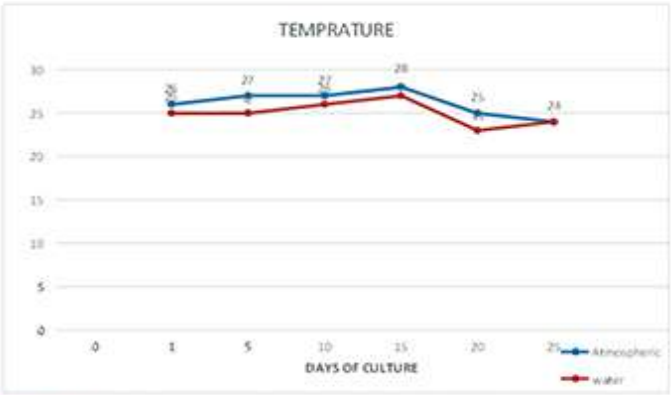
HARVESTING

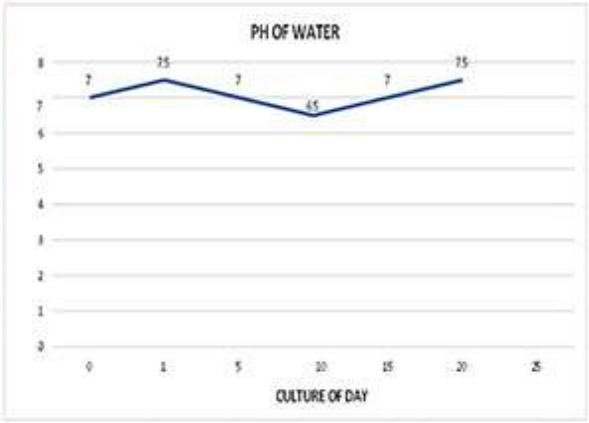
HARVESTED MOINA

MICROSCOPIC VEIW

Stocking in the 500 Liter Tank :

After the completely harvesting in the 100 litre tank then transfer the 500 litre big tank before the transferring cleaning the tank and disinfecting the tank and then drying one day after the drying one day filling the tap water 500liter maintaining the water temperature and the ph of water after the maintaining all water parameters , dissolving the Moina inoculum in the water and continue the culture. Feeding to the Moina regularly morning and evening two time and maintaining the water parameters regularly.





CONCLUSION :

- Moina are grow and survive both feed goc and yeast
- But as compare to the goc ,yeasts gives the good growth and survival.

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Species specific Identification for Vibrios

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Promoting Sustainable Aquaculture : Cage Culture Demonstration at Amalnala Dam

In a significant move to foster sustainable aquaculture, the Foundation for Aquaculture Innovation and Technology Transfer (FAITT) has launched a cage culture demonstration at Amalnala Dam in Chandrapur district. This initiative is part of FAITT's broader mission to advance responsible and efficient fish farming practices.

The project features two demonstration cages, each stocked with 1,000 fish having an average body weight (ABW) of 106 grams, bringing the total to 2,000 fish. The demonstration aims to showcase best practices in cage culture and empower local communities to adopt sustainable aquaculture techniques.

Key Activities and Preparations

To ensure the success of the demonstration, several preparatory steps were carefully executed :

- Selection and inspection of cages
- Stocking of fish in both units
- Regular net maintenance and inspection
- Accurate fish counting and cage-specific observations

These foundational tasks have laid the groundwork for an effective and educational demonstration, providing a live model of efficient cage management.

Sorting of the fishes

Attachment of grow out net

Proper attachment of bird net

Practical Training for Local Farmers

As part of the initiative, FAITT conducted practical, hands-on training sessions for local farmers under the theme **"Follow the Basics."** These sessions covered a comprehensive range of topics to ensure that farmers gain the necessary skills to manage cage farming independently.

Key focus areas included :

- Systematic fish counting and sampling
- Proper attachment of bird nets to prevent predation
- Installation of grow-out nets
- Sorting and grading of fish by growth stage
- Feeding management within cages
- Basic disease management techniques
- Harvesting procedures

Farmers actively participated in the training, gaining valuable field experience in cage culture operations.

Building Skills for Sustainable Growth

By integrating live demonstration with farmer training, the Amalnala Dam initiative is helping to build local capacity in sustainable aquaculture. It represents a vital step toward increasing productivity, enhancing livelihood opportunities, and promoting environmentally responsible fish farming.

This demonstration stands as a replicable model for similar projects across the region, showcasing how focused support and community engagement can drive meaningful progress in aquaculture innovation.

For more information or support related to cage culture and commercial fish farming, please contact FAITT at **info@faitt.org**

Checking of net before stocking

Attachment of bird net

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