

FISH FARMING FOR PROSPERITY



Fisheries and Animal Resources Development Department,  
Government of Odisha

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Celebrating women empowerment in Odisha

# FISH FARMING FOR Prosperity

Fish Farming in Gram Panchayat Tanks  
by Women Self Help Group

Celebrating women empowerment in Odisha







Presented by



Fisheries and Animal Resources  
Development Department,  
Government of Odisha

MISSION  
**Shakti**

Department of Mission Shakti,  
Government of Odisha

Technical Partner



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**Naveen Patnaik**  
Chief Minister, Odisha



**LOKASEVA BHAVAN**  
BHUBANESWAR

## FOREWORD

Empowering women and making them play a pivotal role at all institutional levels is the key to social transformation and hence the overall development of Odisha. Mission Shakti was formed under the Women and Child Development Department way back in 2001 for the development and empowerment of women by formation of women self-help groups and providing them various socio-economic opportunities in the State.

I am happy to note that the convergence scheme on scientific fish farming in Gram Panchayat tanks by Mission Shakti SHGs through long-term leasing policy by involving 2000 Mission Shakti SHGs each year is under successful implementation across the state since 2018-19. Since fish is of great demand in the state and a lot of water bodies, including Gram Panchayat tanks are lying unutilised or underutilised, this scheme is an opportunity to empower women and contribute to livelihoods, income, food and nutritional security for local communities. I am also happy to note that nutrition-sensitive carp-mola polyculture is being promoted under this program. My government intends to lease out all 64,000 GP tanks in the state to Mission Shakti SHGs in order to produce more than 1 lakh metric ton of fish valuing Rs. 1200 Crores annually and also bringing huge nutritional gains among Mission Shakti SHGs and local communities.

I congratulate the Departments of Mission Shakti, Fisheries and Animal Resources Development, Panchayati Raj and Drinking Water for successfully designing and implementing the inter-departmental convergence programme of fish farming in GP tanks by Mission Shakti SHGs. I also appreciate WorldFish for extending technical support to the program and for bringing out a book for showcasing the chronicles of success.

**(Naveen Patnaik)**





Fisheries and aquaculture sector is one of the fastest expanding food-producing sectors in the state of Odisha providing livelihoods to over 1.4 million people. Under the visionary leadership of Hon'ble Chief Minister Sri Naveen Patnaik, fisheries have been identified as a priority sector and over the last two decades the fish production in our state has increased significantly. Implementation of new schemes and the adoption of cutting-edge technologies by farmers, fishermen, and other stakeholders have resulted in rapid expansion in the fisheries sector. The Government of Odisha has recognized women's empowerment as one of its core development priorities. It is a well-known fact that the economic empowerment of women significantly contributes to their social empowerment and inclusive development in society.

Considering the strength of our women and for best utilization of over 64,000 water bodies under the Gram Panchayats, a flagship scheme named "Input assistance to Women Self Help Groups for Pisciculture in Gram Panchayat tanks" was launched by the Government in 2018. This is an inter-departmental convergence initiative involving three departments: Fisheries and Animal Resources Development, Mission Shakti and Panchayati Raj and Drinking Water Departments.

Sensing this great opportunity to produce fish in these GP tanks, the local Mission Shakti SHGs have shown an overwhelmingly positive response to the scheme. During the first 3 years, nearly 6242 GP tanks with a water spread area of 5043 hectares, were successfully brought under scientific fish farming with the vibrant involvement of 6235 Mission Shakti SHGs. It is pertinent to note that, the Mission Shakti SHGs produced about 3700 metric tons of fish worth Rs. 53 crores in 2019-20 alone.

This paramount achievement inspired the Mission Shakti SHGs to be self-confident and continue fish farming the GP tanks without additional financial assistance from Government. In a visual mode, this book portrays the success of the program and showcases women's participation in government schemes. My special thanks to officials of the Fisheries and Animal Resources Development and Mission Shakti Departments as well as the Odisha-WorldFish Project for their remarkable contributions and exceptional accomplishments.

**Dr. Arun Kumar Sahoo**  
**Hon'ble Cabinet Minister**  
**Agriculture & Farmers' Welfare, Fisheries & Animal Resources Development, and Higher Education Department**  
**Government of Odisha**



Empowerment of women through the Self-Help Groups under the Mission Shakti Department is an important commitment of the Government of Odisha. "Mission Shakti" is a self-help mission aimed at empowering women by encouraging them to form Mission Shakti Self Help Groups and engage in various socio-economic activities. Throughout the year, regular handholding and monitoring is carried out to boost the activities of existing Mission Shakti SHGs .

The fisheries and aquaculture sector has been recognized as a powerful tool for income and employment opportunities and provides livelihoods of millions in the state. This sector has enormous potential to address agriculture and rural development challenges such as food, nutrition, and livelihood security. In 2018, Mission Shakti SHG Involvement in fish farming was explored with special focus on the long-term lease of Gram Panchayat tanks to the Mission Shakti SHGs. Initially it was a challenge for the Mission Shakti SHGs to take up fish farming in a non traditional scientific manner. The SHGs, however, worked diligently, participated in trainings on fish farming, and demonstrated their efficiency. As a result, a successful fish farming operation has been established covering 6242 Gram Panchayat tanks with an area of 5043 ha under a long-term lease. It has not only bolstered the endurance of our women, but it also instilled confidence in the minds of other SHGs. Previously, the Mission Shakti SHGs had already made significant contributions to the state's economic development through a quantum of activities, but this fish farming venture proved to be particularly fruitful in terms of their participation and contribution.

This book documents the success of our women groups in fish farming over the last three years. I hope it will inspire our SHGs to continue the practice and extend the programme. I applaud all the government officers and the WorldFish team for successfully administering the scheme and documenting the success of Mission Shakti SHGs through this immensely valuable publication. I congratulate all our SHG women who have contributed in making this initiative a success.

**Smt Tukuni Sahu**  
**Hon'ble Minister**  
**Department of Women & Child Development**  
**and Mission Shakti**  
**Government of Odisha**





Fisheries and Aquaculture is one the fastest growing sectors in Odisha and has played a pivotal role in contributing to food and nutritional security, economic development as well as generating employment and livelihood opportunities in Odisha. Odisha's fish production has more than tripled over the last 2 decades from 2.6 lakh metric tons to 8.73 lakh metric tons and is currently ranked fourth in the country. As one of the major coastal states of India, the State Government has placed paramount importance on the development of inland, brackish water and marine fisheries.

Odisha is blessed with 6.86 lakh hectares of freshwater resources which constitute the backbone of fish production in the state. The Gram Panchayats have large number of community water tanks under their jurisdiction which has tremendous potential for pisciculture. The State Government has introduced a proactive and enabling policy for providing long-term lease of Gram Panchayat tanks to the Mission Shakti Self-Help Groups (SHG) on priority and also provides initial capital assistance and trainings to take up fish farming.

The Mission Shakti SHGs are successfully taking up fish farming with adequate capacity building and support and have been able to generate substantial returns. The State Government intends to cover at least 15,000 Mission Shakti SHGs across the state under scientific pisciculture. This book compiles the journey of Self-Help Groups in their endeavor for commercial fish farming. I thank my team and WorldFish for putting together this book.

**Shri. R. Raghu Prasad, IFS  
Commissioner-cum-Secretary  
Fisheries & Animal Resources Development Department  
Government of Odisha**



It is well established that economic empowerment of women is key to their holistic empowerment and the inclusive growth of the state. The promotion of Mission Shakti Self-Help Groups has therefore been adopted as a key strategy for achieving this goal.

The “Scientific fish farming in Gram Panchayat tanks by Women SHGs” programme was started in 2018 to improve fish production, address malnutrition, and provide livelihood support to women groups by leasing the existing Gram Panchayats tanks to SHGs on a long term basis.. To undertake this activity scientifically and to maximise production, frequent extension support and supportive supervision was provided from the Fisheries & Animal Resources Development Department and Mission Shakti Department at the farm level.

The progress was encouraging when 6242 GP tanks with a total water spread area of 5043 ha were brought under scientific fish farming with the active involvement of 6235 Mission Shakti SHGs. This also became a key initiative in the overall decision of Government to procure 5000 cr worth of goods and services from SHGs over 5 years, The COVID-19 pandemic situation did not deter the spirit of Mission Shakti SHGs from continuing their fish farming activity. They successfully harvested about 3700 metric tons of fish valuing Rs. 53 Crores during 2019-2020. This success has motivated other Mission ShaktiSHGs in the area to take up fish farming in GP tanks on a large-scale basis.

The technical collaboration with WorldFish was very instrumental in the successful implementation of this scheme. I appreciate the FARD Department and WorldFish for bringing out this book chronicling the success of Mission Shakti SHGs in the fish farming venture. This book is a tribute to the lakhs of Mission Shakti women across the state who work hard to improve their lives and consequently synergise and strengthen rural and urban micro economies .

**Smt. Sujata R Karthikeyan, IAS  
Commissioner-cum- Secretary,  
Department of Mission Shakti  
Government of Odisha**





Challenging gender bias and championing the role of women in aquatic foods systems are actions embedded in the values of WorldFish and central to advancing research and innovation for healthy people and planet. Women make up half the workforce and play a prominent role in fisheries and aquaculture economies worldwide. Women working across the food system produce, process, sell, and trade aquatic foods and products. Their contributions are critical to food and nutrition security, gender equality, and multiple Sustainable Development Goals. Despite women playing a crucial role in providing labour, innovative ideas, and entrepreneurship, they face many inequities in wages and access to productive resources, technology, and the market. As a result, their work and economic contributions often go unrecognized in official statistics, sector policies, and development programs.

Since 2016, the technical collaboration between WorldFish and the Fisheries and Animal Resources Development Department of the Government of Odisha, India, has provided an excellent opportunity to close these gender gaps and scale climate-smart, nutrition-sensitive, gender-equitable, and sustainable fish production systems. The pioneering women-centric Government policy on long-term leasing of Gram Panchayat Tanks for fish farming by women Self-Help Groups is a highly praiseworthy initiative of the Government of Odisha for women empowerment and inclusivity. The program was initiated in 2018 and scaled after that through an inter-departmental convergence scheme, “Fish farming in Gram Panchayat Tanks by women Self-Help

Groups,” has already brought significant socio-economic benefits at the community level in all 30 districts where the initiative was tested. Given the opportunity to expand the program to several thousand Gram Panchayat Tanks and the involvement of hundreds of thousands of women, WorldFish and the Odisha Government foresaw the substantial contribution of this scheme in bringing transformational changes in the development of aquatic food systems’ landscapes in Odisha.

This year, in particular, we recognize the remarkable efforts by the Government of Odisha and its people, especially women, to shape a more equitable future and recovery from the COVID-19 pandemic. Women stand at the front lines of the crisis and often were and continue to be the first and hardest hit by disruptions to aquatic foods systems value chains, threatening progress on women’s equality, poverty alleviation, as well as their nutrition and health. Despite all these unprecedented challenges, the women of the self-help groups in Odisha have shown remarkable resilience through unparalleled participation in this scheme.

I heartily congratulate the Government of Odisha under the visionary leadership of Honourable Chief Minister of Odisha, Shri Naveen Patnaik, Dr. Arun Kumar Sahoo, Honourable Minister of Agriculture and Farmers’ Welfare, Fisheries and Animal Resources Development, and Higher Education, Smt. Tukuni Sahu, Honourable Minister of Women and Child Development, and Mission Shakti, Mission Shakti Department, and Shri Pratap Jena, Honourable Minister of Panchayati Raj and Drinking Water Department, and all the officials of the convergence Departments for such a great effort and teamwork for successfully rolling out this scheme. WorldFish is so proud to be a technical partner to the Government of Odisha in this endeavour. I congratulate the team for bringing out this excellent coffee table book, “Celebrating women empowerment in Odisha. Fish farming for prosperity: Fish Farming in Gram Panchayat Tanks by Women Self Help Groups,” which chronicles the field actions and outcomes under the convergence scheme.

**Dr. Gareth Johnstone,**  
**Director General, WorldFish**







## Foreword

Fishing lies in the blood of Odisha. The state of Odisha is blessed with rich waters from most sides and fishing has been the one thing people from many parts of Odisha have grown up doing. Not just the most important ingredients every day on our plates, the Government of Odisha sees fish as a source of livelihood and nutrition for its people. To feed is noble. But it is nobler to empower one to feed the whole village. This book is an attempt to record the account of the Government of Odisha's honest efforts in empowering the women of Odisha. By feeding the best of nutrition to their families and the people of the state, in earning a living and adding to the prosperity of the state and the country.



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01

## Odisha Introduction

The Sanskrit word 'Odra Vishaya' or 'Odra Desa' gives the state of Odisha its name. Once a land of Kings and Kingdoms, Odisha now boasts of being a rich source of natural resources. Its people, temple architecture, classical dance, religions, fairs & festivals, unique handlooms & handicrafts, green woodlands, rock caves and the charming blue hills have always attracted historians, tourists and travellers from all over the world. The rich history, revolutionary freedom movement, fascinatingly sculptured temples & monuments, tribal life characterized by dance, music, rituals, hunting, gaiety and wild ways of Odisha have become important topics of research for great historians and scholars.





# Odisha Fisheries

Odisha is home to **45 million** people. The State Gross Domestic Product during 2019-20 was Rs. 5.20 Lakh Crores (USD 70 Billion). Majority of people depend on Agriculture, Animal Husbandry and Fisheries sector for their livelihoods. With a coastline of 480 kms and **640,000 ha of inland freshwater water bodies**, fishing is an important source of livelihood in Odisha. There are more than 1.50 million fishers in the state.



## Odisha is 4th largest fish producer in India.

It produced 816,000 Metric Tons of fish in 2019-20 valuing Rs. 10,000 crores (USD 1.35 billion). The fisheries sector has grown remarkably over the last decade with a CAGR of 12%. Odisha has one of the highest fish consumption population in India. As per National Family Health Survey – 4(2015-16), 94.4% of people in Odisha consume fish. The per-capita annual fish consumption in the state has increased from 7.71 Kg in 2000-01 to 16.24 Kg in 2019-20. Due to high demand for fish, Odisha is importing significant quantities of fish from neighbouring states.

Sensing the tremendous opportunity in the development of fisheries sector development, Government of Odisha has unveiled Odisha Fisheries Policy-2015 with a goal of “sustainable aquaculture and fisheries sector in Odisha State, India, creating employment, stimulating inward investment and contributing to State goals for reducing malnutrition among vulnerable and marginalized communities, particularly women and children”. On June 28, 2016, WorldFish signed a memorandum of agreement with the Fisheries and Animal Resources Development Department (F&ARD), Government of Odisha for 5.50-year technical collaboration in the august presence of Sri Naveen Patnaik, Honourable Chief

Minister of Odisha, India in order to support the State Government in implementation of the Odisha Fisheries Policy 2015. Under the Odisha Fisheries Policy-2015, it was envisaged to increase the fish production from unutilized and underutilized Gram Panchayat tanks across the state. Long-term leasing of Gram Panchayat tanks to Women Self Help Groups for fish farming was the best way forward for equitable use of GP tanks and women empowerment through income generation and nutritional gains.

For this purpose, an appropriate inter-departmental convergence scheme was initiated involving **Fisheries & ARD Department, Panchayati Raj and Drinking Water Department and Mission Shakti Department.**







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03

## Gram Panchayat Tanks

Odisha has about **62,000 multi-purpose Gram Panchayat tanks (54,000 ha)**. These have been constructed under various Government schemes over last several years. They are locally administered by Gram Panchayats under Panchayati Raj and Drinking Water Department (PR&DW). Local villagers use the GP tank water for various purposes such as bathing, utensil cleaning, animal bathing, irrigation to agriculture farms etc. Some of them are derelict due to water shortage, excessive growth of water plants etc. Most of them are un-utilised or under-utilised for fish production.









## Mission Shakti SHGs

Formation of Mission Shakti SHGs is a well-established strategy in India for empowering women and improving their livelihoods. The Department of Mission Shakti in Odisha has taken significant measures to support close to **7 lakh Mission Shakti SHGs** in the state, by enabling them to access financial assistance, undertake capacity strengthening and market linkage to enhance their livelihoods and incomes. Economic activities through Mission Shakti SHGs significantly supplement incomes of women smallholder farmers, a critical vulnerable group, deprived of access to agricultural credit, inputs and markets, owing to gender-based discrimination. It is also true that income in the hands of women ensures food security and nutrition for the entire family. Therefore, empowering and equipping them with better incomes will bring greater benefits to community food and nutrition security.



**Mission Shakti's sequential engagement with Mission Shakti SHGs and in line with the overall objective.**

### Coverage

Mission Shakti SHGs have a greater coverage in rural areas, and their bank linkage in both rural and urban areas is almost universal. Associated in an array of activities, mostly private (such as vegetable cultivation, pisciculture, terra cotta craft, etc) and a few linked to government schemes (such as production of take-home rations, management of paddy procurement centres, electricity meter reading, etc).

### Capacity building

Mission Shakti SHGs received training related to the operations of the group and bookkeeping from Anganwadi Workers, and on skill building from various public and private sources.



### Financial assistance and management

All Mission Shakti SHGs have bank accounts with steady member contributions, and most have received the seed money of INR 15,000 provided by Mission Shakti. Training in financial management is important to enable better financial planning and utilization of funds by Mission Shakti SHGs.

### Market linkage and profits

Mission Shakti promotes market access for the Mission Shakti SHGs by organizing 'melas' or fairs at district and state level and supporting Mission Shakti SHGs in participating in these fairs. Mission Shakti SHGs also make their own efforts to reach local markets for their produce, and explore other external markets, including online platforms.





Activities of  
Mission Shakti SHGs

- Paddy Procurement
- Fish Farming
- Electricity Meter Reading
- Public Distribution System
- Hospital Diet Management
- Supply of Pre-School Uniform
- Farm Pond
- Poultry
- Dairy
- Goat Farming
- Mushroom Cultivation
- Vegetable Cultivation
- Agriculture Production Cluster
- Take Home Rationtion
- Producer Group
- Agri-Enterpriser
- Millet Enterprises
- Tailoring Units
- Spices Unit
- Pickle Unit
- Dokra unit
- Terracotta unit
- Handloom





ମିଶନ ଶକ୍ତି ଭାବନ  
MISSION SHAKTI BHAWAN





## The Long-term Leasing Policy

To facilitate scientific fish farming in Gram Panchayat tanks by Mission Shakti SHGs, during 2018-19, Panchayati Raj and Drinking Water Department, Government of Odisha has brought a favourable policy to lease out the Gram Panchayat tanks on a long-term basis (3-5 years) as a priority for a Mission Shakti SHGs.









## The Scheme – Scientific Fish Farming in Gram Panchayat Tanks by Mission Shakti SHGs

Under the flagship program of Honourable Chief Minister, the Government of Odisha through Fisheries & ARD Department has unveiled a scheme named “**Scientific fish farming in Gram Panchayat tanks by Mission Shakti SHGs**” during 2018-19. Under this scheme, every year 1500 ha of GP tanks managed by 2000 Mission Shakti SHGs was targeted for fish farming. By 2023-24, 15,000 nos. of Mission Shakti SHGs are targeted under this scheme. Under this scheme, the Fisheries & ARD Department provides financial support to the Mission Shakti SHGs at a rate of INR 90,000 per hectare of Gram Panchayat tank.



### Scheme objectives:

- To promote scientific aquaculture in GP tanks managed by Mission Shakti SHGs
- with the adoption of Better Management Practices.
- To enhance the GP tank fish productivity to 2.50 ton/ha/crop of 6 months or 5 ton/ha/year with 2 crops per year by promotion of semi-intensive aquaculture systems among the Mission Shakti SHGs in the state as per the targets under State Fisheries Policy 2015.
- To promote production, timely supply and stocking of advance fingerlings (50-100g size) procured from backward linked Mission Shakti SHGs managed GP tank nurseries by following the cluster approach.
- To promote nutrition-sensitive
  - carp-mola polyculture
  - To popularize use of supplementary feeding practices for increasing the carp yield.

During the last 3 years (2018-19, 2019-20 and 2020-21), in total, 6,242 nos. of GP tanks with a total water spread area of 5,043.52 ha were brought under scientific fish farming with involvement of 6,235 nos. of Mission Shakti SHGs under this scheme with long-term leasing policy of the state.





# Tagging Gram Panchayat tanks to Mission Shakti SHGs

Block development officers assign the targets to the gram panchayats to lease out the GP tanks to Mission Shakti SHGs. Gram panchayat identifies suitable GP tanks and inform the local working authorities of Mission Shakti and Fisheries Department. Block level Fisheries officer along with Gram Panchayat Executive Officer (GPEO), Block Project Coordinator (BPC) of Mission Shakti jointly identify suitable GP tanks in each Gram Panchayat for fish farming. Mission Shakti identifies an interested and capable Women Self Help Group from the village to avail the scheme benefits. If more than one Mission Shakti SHGs is interested in availing the scheme benefit, then the GP tank is auctioned among the Mission Shakti SHGs.

Process/Criteria for selection of GP tanks:

- Small GP tanks preferably less than 1 Hectare
- Near to the fish farming cluster
- GP tank having strong dyke and an average water depth of 5-6 feet
- If GP tanks are used for fingerling nursing, the total nursery area should not exceed 25% of the grow-out tank area for sustainable market linkage

Long term lease:

The long-term lease agreement is executed by BDO on payment of prescribed lease value. Once the lease is finalized, the Mission Shakti SHGs deposit the minimum lease value of Rs. 2,000/- per Acre per year or as per the bid winning value during auction process.









# Training Mission Shakti SHGs in Fish Farming

Mission Shakti SHGs are trained and equipped to ensure sustainable, stable and scalable growth in Fish Farming through optimal use of its resources employing advanced technology.

**Mission Shakti SHGs are trained at two levels:**

- 1. Block level training prior to the crop season
- 2. Farm-gate technical training and services by Fisheries extension officers



## 01 Block level training

- Long-term leasing Policy
- Scheme information
- Business planning for fish farming
- Access to Finance
- Technical know-how on fish farming in GP tanks
- Fish Marketing
- Nutritional Gains from fish consumption

**Bank loan**

Mission Shakti SHGs can avail bank loans at 0% interest as per prevailing Govt. scheme. Bank loan is provided to the Mission Shakti SHGs on the recommendation of District Fisheries Officers. Loan maximum of Rs. 300 lakhs is allowed without any interest for the Mission Shakti SHGs. Loan is provided based on the culture area.

**Financial Assistance**

F&ARD providing financial assistance at @60% of the unit cost (Rs 90,000 per/ha)

## 02 Farm-gate technical training and services

Farm-gate technical training and services by Fisheries extension officers

Fisheries extension staff block the ponds of Mission Shakti SHGs and visit at regular intervals. And render technical support on fish farming and better management practices. They clear the doubts and test the water quality every time to maintain a record.









## Fish Farming Activities



### Tank Cleaning

After identifying the GP tanks, one of the crucial step is to clean the tank embankment, remove water plants and eradicate predatory fish by repeated netting.

#### Embankment cleaning

Cleaning the side areas so that no extra plants and animals obstruct the fish farming.

#### Removal of weed plants

Removal of weeds and unwanted plants from the pond as well as dike.

#### Eradication of predatory fish

Predator fish can hide if the pond and dyke are not clean, and it will be difficult to walk around the pond. Predatory fish can be removed using repeated netting or using mahua oil cakes/bleaching powder in combination with urea.











## Liming and Fertilization

**Liming improves the quality of the pond soil, improves and stabilizes water quality, improves the growth of natural food of fish (plankton) and increases the availability of nutrients.** One of the most important effects is that it adjusts the total alkalinity and pH of the water in a pond.

**Fertilizer is used to increase the production of natural fish food organism in the pond (phytoplankton and zooplankton).** Inorganic fertilizer like Urea can be applied @20 kg/Acre and Single Super Phosphate @40 Kg/Acre, Murate of Phosphorous @50 Kg/Acre or Organic fertilizers like biogas slurry/cow urine/oil cakes or mixture of both organic and inorganic fertilizers cab be applied depending upon availability and cost.

The dosage of the lime and fertilizers used may depend on condition of each pond.







# Fish seed selection and release to GP tanks

## Fish Hatchery, Nursery and Seed rearing tanks

Fish hatcheries are set up to artificially breed the sexually mature fish (>2 year age, >1 kg size), hatch the eggs to hatchlings (spawn). Spawns are raised to fry 20-30 mm length (baby fish) in nursery tanks over a period of 3 weeks. Fry are further raised to fingerling size (80-100 mm in length) over next 2-3 months in seed rearing tanks. They are further raised in seed rearing tanks for 2-3 months to produce advanced fingerlings or zero size fingerlings (50-100 gram size).



Management in fish nurseries and rearing tanks is a very crucial step in carp culture as the spawn and fry are very delicate to various environmental conditions and thus require close monitoring. Stocking right quantities of quality fish seed of the right species combination is vital. Protection of fish seed using bird fencing and animal fencing remarkably increases the seed survival rates.

It is recommended to promote a stocking density of 70,000 fry over ha (20-40mm size) in seed rearing tanks to achieve the targeted productivity of 25,000 numbers of advance fingerlings (50-100g) per ha for 6 months.







## Release of Advance Fingerlings to Gram Panchayat tanks

**Large size fingerlings (50-100 gram) are known as “Advanced fingerlings” or zero size fingerlings.** They are carefully transported from seed rearing farms to nearby Gram Panchayat tanks using pick-up vehicles modified with tarpaulin liners or sintex tanks with proper oxygenation of water using water pumping or using oxygen cylinders. The seed transportation is done during the early morning or late evening or nighttime to avoid stress from intense sunlight and high temperature. Prior to the release of fingerlings, they are acclimatized to GP tank water conditions for 15-30 minutes by floating the seed bags on the surface of the tank water. The recommended stocking density in GP tank is 2700 - 3000 nos. of advanced fingerlings per Ha. In addition to carp fingerlings, mola (mahurali) can be sourced from local ponds and stocked in GP tanks at a density of 25 kg per Ha.

### **Benefits of Advance Fingerlings:**

1. Faster growth rate
2. Short the production period
3. Lowers the risk of predation
4. High survival rate
5. Possibility of two or more grow-out crop cycles per year



# Feeding

## 1. Commercial Pellet feed

## 2. Local or farm-made feed

## 3. Feed distribution in the tank:

- Bag feeding
- Hand spreading from the pond embankment

Formulated commercial pellet feeds are ideal. There are two types of pellet feeds: floating feed and sinking feed. If commercial feeds are not locally available, Mission Shakti SHGs can prepare farm-made feeds using locally available agriculture byproducts such as rice bran and oil cakes. Feed should be properly distributed in the tank so that fish can properly consume the feed. Bag feeding using perforated feed bags is a very popular demand feeding method in which the hungry fish sucks out the feed from the holes in the bags. The feed quantity is adjusted as per a standard feeding chart. Excessive feeding is avoided to reduce the losses and deterioration of water quality.









## Water Quality Testing

Water quality is important for healthy fish. It is important to check the water quality at least once a week to properly maintain the water quality. Important water quality parameters are pH, dissolved oxygen, transparency, alkalinity and ammonia.









## Monthly Sampling for Growth and Health Monitoring

Sampling is done to assess the growth, health status, biomass calculation and supplementary feed requirement of fish being cultured in pond. Cast net sampling is done once a month to catch a few fish (5-10 nos.) After thorough observation of the fish, they are released back to the tank. If any disease or infection is found, appropriate treatment is immediately given to fishes in the tank to prevent loss.









## Fish Harvesting

Fish harvesting is done when they grow to market size (>700 grams) and when there is good demand for fish in the local market. They can be partially harvested on a weekly basis to generate regular income to Mission Shakti SHGs.

Mission Shakti SHGs can share small quantities of fresh catch among themselves for household consumption. Most of the tanks have highly nutritious small fish (mahurali / mola). Mission Shakti SHGs share them for household consumption. Normally, the targeted fish yield is 2500 kg of Carps/ha per crop and 250 kg of mola/Ha per crop.

*Drag nets are being provided to Mission Shakti SHGs for better harvesting of fish.*









## Fish Marketing and Consumption

There is a huge demand for live and fresh “**Desi Maachho**” in villages of Odisha. Therefore, Mission Shakti SHGs directly sell the fresh catch at their farm-gate to local retail customers at premium prices. If catches are huge and beyond the local demand, then they sell it to wholesale fish traders at prevailing market prices. Some Mission Shakti SHGs have taken the benefit of scheme “autorickshaw with ice box” from the Fisheries & ARD Department to sell the fish in nearby bigger fish markets.









## Profit Sharing

Normally, the cost of production is Rs. 150,000 per Ha per crop. Revenue from sale of 2500 kg of fish @ 120 Rs/kg is Rs. 300,000. Therefore, Mission Shakti SHGs make a decent profit margin of Rs. 150,000 per ha per crop. They save and reinvest the original investment of Rs. 150,000 for next crop season. **The profit earned is shared among the Mission Shakti SHGs members.**









## Mola (Mahurali)

Mola (Mahurali) is a small indigenous fish species, which is highly nutritious and easily grows with Indian Major Carps in polyculture system in Gram Panchayat tanks. **Mola is extremely rich in micronutrients especially vitamin A & D, Calcium, Iron and Zinc.** Small quantities of mola can be regularly caught from the tank using gill nets and cast nets. Household consumption of Mola among Mission Shakti SHGs of vulnerable communities is promoted in order to reduce the widely prevalent **Malnutrition** in Odisha.

### Why Mola?

- It is very rich in micronutrients
- Highly compatible for polyculture with Carps
- Compatible for production in all type of ponds and tanks.
- Breeds automatically in ponds.
- Easy for household consumption.
- High market demand









## Integrated Fish Farming with Horticulture

Horticulture crops such as Turmeric, Sweet potato, Banana, Brinjal, Okra, Papaya, Chilli, Marigold flower etc are cultivated on embankments of the Gram Panchayat tanks. They are utilised by Mission Shakti SHGs for their own household consumption and for local sale as well to generate income.







The Government of Odisha is committed to nurturing and growing this incredible initiative.  
Promising a better livelihood and nutrition to women, their families and their community.

**Today, tomorrow and into the future.**