18. Establishment of Mini Fish Feed Mill with capacity of 08 MT per day

Culture of commercially important species of fishes has gained huge popularity in recent years. Scientific interventions have been intensified to standardize culture practices of several diversified fish species of fresh water, brackish water and marine habitat. Consequent to researches done in India and abroad, a strong database has developed about nutritional behavior of great majority of these cultivable fish and shellfish species, and several feed formulations have been successfully undertaken. Feeding with formulated feed in combination with optimum management practice can increase production to many folds.

While it has been established that there are about 40 essential dietary nutrients required by fish and shellfish which can only be met up through supplementary feeding and feeding practice in an aquaculture operation accounts for over 60% of total input cost, there has always been a shortage of supply of well formulated feed for aquaculture resulting in disrupted balance of demand and supply. In this situation, to bridge the gap of demand and supply initiatives have been taken up to establish fish feed mills in different regions of West Bengal with the help of the Government.

Name of the Scheme Establishment of Mini Fish Feed Mill with capacity of 08 MT per day

Project Summary

There are vast and varied fisheries resources in a state like West Bengal. Lack of nutritionally balanced formulated feed has always been a hindrance to increase production to optimum level. Establishment of mini feed mill with a capacity of 8MT per day in different districts of the state can ensure availability of balanced feed at affordable price. The pelleted feed produced in such mills can be marketed locally in the districts itself as there is high demand but inadequate supply in every locality.

a. Items to be manufactured: Fish Feed
b. Capacity of the plant: 08 MT/day
c. Source of power generation/electricity: Electricity form WBSEDCL
d. Source of water supply: Own Borewell
e. Connectivity to road/railways: SH
f. Mode of transport: Pickup/Truck/Others
g. Market: Through distributors/ local market
h. Employment Generation: 20 nos.
i. Waste disposal: Solid Waste Management (bio-degradable)

Objectives

- To ensure regular supply of nutritionally balanced aqua-feed at affordable price
- To increase fish production of the state through use of formulated feed
- Employment generation through promotion of aqua-entrepreneurship

Technical Details:

A) **Project Location:** Different districts of West Bengal as detailed in Fund Requirement Table.

B) **Feed Formulation process :**

i) Selection of Ingredients

Selection of ingredients for formulation of fish feed is based on nutritional requirement of fish, nutritional value of the ingredients, their availability in the locality, cost of the ingredients and digestibility. Several agro-based ingredients have been identified for their use in fish feed formulation including ground nut oil cake, soybean meal, mustard oil cake, wheat flour, rice polish, rice bran, fish meal etc.

ii) Grinding

Grinding or particle-size reduction is a major function of feed manufacturing. Many feed mills pass all incoming ingredients through a grinder for several reasons: a) clumps and large fragments are reduced in size, b) some moisture is removed due to aeration, and (c) additives such as antioxidants may be blended. The grinding of ingredients generally improves feed digestibility, acceptability, mixing properties, pelletability, and increases the bulk density of some ingredients. It is accomplished by many types of manual and mechanical operations involving impact, attrition, and cutting. A hammer grinding machine fish feed hammer mill processes feed stuffs of various granularity into small pieces. Working principle of this machine: a hammer hits and breaks raw materials in the crushing chamber with high-speed rotation; then the broken materials move with continuous friction and crash against the hammer, toothed plate and sieve for crushing

iii) Mixing

It is the efficient mixing process that is the key to high quality fish feed production. Some materials with smaller particle size have bad fluidity, so they need to be mixed for longer time for even mixture. Total blending time is such crucial and is affected by the composition of fish feed formula. A fish feed mixer, also called ribbon blender can mix various fluid and thick, pasty and granular materials. With excellent design and easy operation, it is made of high quality stainless steel, contributing to its wear-resistant strength and long lifespan

iv) Pelleting

The transformation of a soft, often dusty feed into a hard pellet is accomplished by compression, extrusion, and adhesion. The general process involves passing a feed mixture through a conditioning chamber where 4 to 6 percent water (usually as steam) may be added. Moisture provides lubrication for compression and extrusion and in the presence of heat causes some gelatinization of raw starch present on the surface of vegetative ingredients, resulting in adhesion. Within 20 seconds of entering the pellet mill, feed goes from an air-dry (about 10-12 percent moisture) condition at ambient temperature, to 15-16 percent moisture at 80-90°C. During subsequent compression and extrusion through holes in

a ring' die, friction further increases feed temperature to nearly 92°C. Pellets discharged onto a screen belt of a horizontal tunnel drier or into a vertical screened hopper are air-cooled within 10 minutes to slightly above ambient temperatures and dried to below 13 percent moisture.

v) Drying

Pellets need to be dried after extruding so as to remove the redundant water content by fish feed dryer via drying process technology. With this drying machine, materials can enter the channel through conveyor belt and be dried via hotair, after that, the temperature would be lowered quickly to ambient and the moisture would be decreased to around 8% for convenient storage.

vi) Weighing & Packaging

The dried fish feed pellets should be automatically weighed and packed in bags with machine, especially for large-capacity feed production plant. With high accuracy, fast speed, automatic weighing and packing function and excellent operating performance, an automated packing machine can protect fish feed from being contaminated when moving or transporting. This device not only adds productivity but also lower labour intensity, it is also suitable for bagging materials, such as fish feed pellets, seeds, grains,organic fertilizer.

Project Implementation Plan

i) **Beneficiary Selection Criteria**: The intending beneficiaries (either individual or FPG) are produce documentary evidence of availability of requisite land under its possession (either own or leased).

ii) **Selection procedure of beneficiary :** At the district level, the proposal placed before the DLC shall approve the list of screened beneficiaries

iii) Implementation of the Project

The proposed scheme "***Establishment of Mini Fish Feed Mill with production capacity of 08 MT per day"*** is a beneficiary- oriented scheme. After the due approval of schemes by DOF, of Government, the schemes will be implemented through District Fisheries Officers by the beneficiary under the technical guidance of Block Fishery Extension Officers (FEO).

Time line for Project Implementation

Activity	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR
Submitting DPR												
Approval of DPR												
Beneficiary selection and approval												
Purchase of unit												
Physical verification												
Release of subsidy												
Assessment and evaluation												

Cost Estimate

Establishment of Fish Feed Mill with capacity of 08 MT per day

Sl. No.	Description	Amount (in lakh Rs.)
Capital Cost		
1	**Land**	Own
2	Cost of Land Development and Construction Expenses (4000 SQFT @ Rs 750.00 per SQFT)	30
3	**Plant And Machinery**	
a)	Course Mill (500 Kg/H)	2.8
b)	Paddle Mixer Machine (150 Kg/H)	1.35
c)	Feeding Convair (600 Kg/H)	1.2
d)	Single Screw Extruder (500 Kg/H)	12
e)	Conveyors	2.15
f)	Three Layer Dryer	8
g)	Electrical fittings	1
h)	Miscellaneous Accessories	0.5
i)	Packing	1
	Total Capital Cost	**60**
Operational cost for First Month		
4	Total operational expenditure per month (Raw material, Salary, Labour, Repair & Maintenance etc.)	40
Total Project Cost		**100**

Economics

Sl. No.	Details	Amount (in lakh Rs.)
1	Fixed Capital Cost	60
2	Working Capital Cost for the first month	40
3	Total Project Cost	100
4	Total Production (@ 170 T per month) per annum	2000 MT (Aprx.)
5	Projected Sale Price (@Rs.30000.00 per Ton)	600
6	Total operational expenditure for the year	480
7	Net Annual Income	120

Note: The prices of the above-mentioned items are indicative only. The actual prices of the items may vary as per the local marketing conditions. The govt. subsidy will be given to a beneficiary with or without institutional finance. However, for subsidy calculation purposes the amount will be restricted as per the guideline of the Government

Governme nt Assistance

The total admissible Government Share against the scheme will be limited to:

- 40% of the project cost for general category beneficiaries and
- 60% of the project cost for weaker sections like Scheduled Castes (SCs), Scheduled Tribes(STs) andwomen.

Beneficiary contribution can either be self-financed or bank loan or both.

Eligible Beneficia ry

All Fishers, Fish farmers, Fish workers and Fish vendors, Fisheries Development corporations, Self Help Groups (SHGs)/Joint Liability Groups (JLGs) in fisheries sector, Fisheries cooperatives, Entrepreneurs and private firms, Fish Farmers Producer Organizations/Companies (FFPO), SCs/STs/Women/Differently abled persons

Sources of Fund

The estimated project cost of "*Establishment of Mini Fish Feed Mill with production capacity of 08 MT per day"* has been worked out as 100 lakh per unit as per the Governmental guidelines.