



# Economics behind alterations in the management practices of composite farming of Indian major carps in 24 Parganas (N) District, West Bengal



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## IMC Polyculture

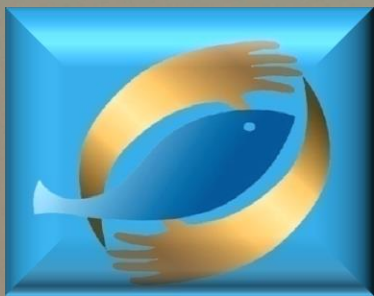
- Stocking two or more compatible fish species is the most ecologically sound fish culture practice which facilitates efficient utilization of all ecological zones within the pond environment enhancing the maximum standing crop.
- In India, culture of the Indian major carps (IMCs) used to be the most popular pond culture practice upto the 70's where:

**Catla (*Labeo catla*) - Surface feeder**

**Rohu (*Labeo rohita*) - Column feeder**

**Mrigal (*Cirrhinus mrigala*) - Bottom feeder.**





## COMPOSITE FISH CULTURE

- The terminology as *IMC polyculture* has been changed to **Composite culture** when co-stocking of compatible exotic carps with IMCs has been introduced where:

Catla (*Labeo catla*) + Silver carp (*Hypophthalmichthys molitrix*) - Surface feeder

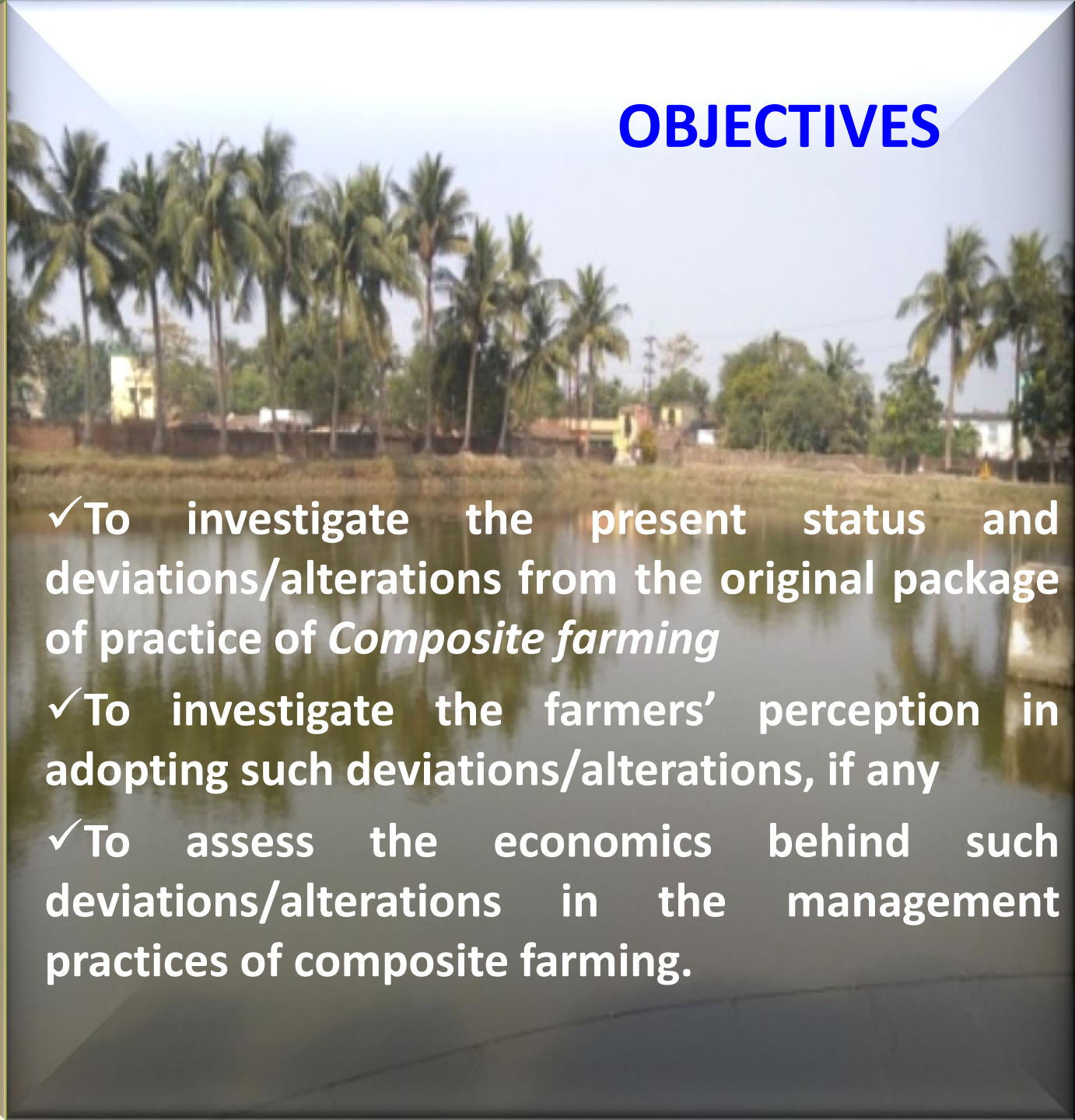
Rohu (*Labeo rohita*) + Grass carp (*Ctenopharyngodon idella*) - Column feeder

Mrigal (*Cirrhinus mrigala*) + Common carp (*Cyprinus carpio*) – Bottom feeder.

*Composite fish culture was developed at the Cuttack Sub-station of the CIFRI and the ICAR was involved in testing its feasibility and economic viability through All India Coordinated Research Project on Composite Fish Culture and Fish Seed Production which was initiated far back in 1971.*

# OBJECTIVES

- ✓ To investigate the present status and deviations/alterations from the original package of practice of *Composite farming*
- ✓ To investigate the farmers' perception in adopting such deviations/alterations, if any
- ✓ To assess the economics behind such deviations/alterations in the management practices of composite farming.





# METHODOLOGY

Primary data collection from the farmers through structured interview schedule from the purposively selected locales of the study.  
The data were analyzed for economic assessment (FAO, 2007).

## Locale of the study:



West Bengal

24 Pgs. (N)

6 Blocks out of  
22 Blocks

50 farmers from each  
Block i. e. total 300  
farmers



Pre stocking		
Variables	Classical package	Status in 24 Pgs. (N) N=300
Excavation of mud (%)	100	5
Racking / ploughing (%)	100	5
Use of mohua oil cake (%)	100	100
Dosage of mohua oil cake (kg/ha/m; %)	2500;100	13.33
Use of lime (%)	100	100
Dosage of lime (kg/ha; %)	200 to 250; 100	45
Cow manure/ FYM(%)	100	66.66
Cow manure/ FYM (kg/ha; %)	5000- 10000;100	13.33
Inorganic fertilizers (%)	100	21.66
Eradication of aquatic insects	Soap-oil emulsion	0
Water test (%)	100	31.66



Stocking		
Variables	Classical package	Status in 24 Pgs. (N) N=300
Seed quality test ( % )	100	0
Disinfection of fish seed ( % )	100	0
Stocking frequency (%)	Once; 100	2-3 times; 72
Stocking density (nos. /ha ; %)	7,500-10,000;100	≥15,000;75
Stocking size (cm ; %)	≤10;100	8-15
Fish species (Nos. ;%)	6; 100	7-10; 75
Stocking ratio	1.5:2:1.5:1.5:2:1.5	Highly varied





## Post stocking

Variables	Classical package	Status in 24 Pgs. (N) N = 300
Use of medicine/antibiotics ( % )	0	76.67
Use of lime (%)	100	71.67
Use of cow manure or FYM (%)	100	0
Use of inorganic fertilizers (%)	100	81.67
Suppl. feed (Rice bran + oil cake ( % )	1:1; 100	Highly varied
Feeding frequency	Once daily	Twice
Feeding rate	4-5% of b.w	Highly varied
Netting (Monthly ; %)	100	58.33
Disease management (%)	100	11.67
Rearing period	1 year	3-4 months





# Economics


Own pond	Classical package		Farmers' altered practice	
Average cost and return (₹ /ha/yr.)	Amount (₹/ha/yr.)	% of total cost	Amount (₹/ha/yr.)	% of total cost
Feed	25,560	17.17	56,240	22.08
Fert. + Manures	52,250	35.11	67,479	26.50
Lime	2,640	1.77	6,894	2.70
Fingerling	12,000	8.06	28,500	11.19
Labour	15,000	10.08	35,000	13.74
Misc. cost	15,864	10.66	42,500	16.69
Fixed input	25,500	17.13	27,000	10.60
Total variable cost (₹)	1,23,314	82.86	2,28,613	86.72
Total cost (A)	1,48,814		2,63,613	
Total return (B)	2,40,000	161.27	6,00,000	235.65
Total profit (C)	91,186	61.27	3,36,387	132.11
Benefit cost ratio (B/A)	1.61		2.34	
ROI (C/A)	0.61		1.42	



Leased in pond	Classical package		Farmers' altered practice	
Average cost and return (₹/ha/yr.)	Amount (₹/ha/yr.)	% of total cost	Amount (₹/ha/yr.)	% of total cost
Feed	25,560	14.60	56,240	19.95
Fert. + Manures	58,967	33.69	67,479	23.93
Lime	2,640	1.51	6,864	2.43
Fingerling	12,000	6.86	28,500	10.11
Labour	15,000	8.57	35,000	12.41
Misc. cost	15,880	9.07	42,862	15.20
Fixed input	45,000	25.70	45,000	15.96
Total variable cost (₹)	1,30,047	74.29	2,36,945	84.04
Total cost (A)	1,75,047		2,81,945	
Total return (B)	2,40,000	137.11	6,00,000	212.81
Total profit (C)	64,953	37.11	3,18,055	112.81
Benefit cost ratio (B/A)	1.37		2.13	
ROI (C/A)	0.37		1.12	

## Comparative analysis of actual price and break-even price (FAO, 2007)



	Actual price (₹/Kg)	Break even price (₹/Kg)	Proportion of break even with actual price (%)
Classical practice; own pond	120	74.41	62.01
Classical practice; leased in pond	120	87.52	72.93
Altered practice; own pond	120	40.06	33.38
Altered practice; leased in pond	120	56.39	46.99





- Introduction of more species including minor carp
- High stocking density with advanced fingerlings
  - Multiple stocking and multiple harvesting
- Selecting species as per the demand of the market
  - Advanced feed and feeding techniques
- Selective reduction /elimination of major carps



**End of presentation**



*Thank You!*



