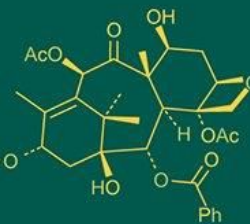
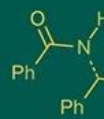


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Trends and constraints in fish production: A case study of Balodabazar district, of Chhattisgarh state

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Abstract

This study analyzes the growth and challenges in fish farming in Balodabazar district of Chhattisgarh. The results show that fish farming is growing steadily, with a 3.03% increase in area and a 13.11% increase in total production. However, productivity (yield per unit area) has slightly decreased by 0.96%, indicating a need for better efficiency. A survey of local fish farmers identified key challenges in production and marketing. The problems include: Limited availability of quality fingerlings, Dependence on middlemen Theft of fish by locals other important issues are lack of feeding knowledge, delayed payments from brokers, and restrictions on using feeds in public ponds. Less serious but still relevant concerns include lack of cold storage, price fluctuations, and weak support from banks. The study highlights the need for improvements in seed supply, market access, training, storage facilities, and farmer support systems to strengthen fish farming in the region.

Keywords: Compound growth rate, area, production and productivity, fish, marketing

Introduction

India ranks third among the world's top fish-producing countries and the second largest aquaculture fish producer in the world. India contributes about 7% to the global fish production. The country is also home to more than 10% of the global fish biodiversity and is one of the 17-mega biodiversity rich countries. Around 14 million people are engaged in fisheries and its allied activities. Chhattisgarh, located in central India, has great potential for fisheries development due to its favourable climate and weather. The state has shown strong progress in aquaculture, but more analysis is needed to confirm this. Fish production in Chhattisgarh is estimated to be higher than the national average in ponds, tanks.

Chhattisgarh is rich in water resources, with about 2.027 lakh hectares available for fish farming. In 2022-23, the state produced 6,51,910 metric tons of fish. Fish is a popular food in India, which has helped the industry grow and encouraged many farmers to take up aquaculture for their livelihood and business. India is the world's second-largest producer of farmed fish, with a total inland production of 10.43 million tons. The State is helping create self-employment in rural areas through fisheries, which also gives people access to healthy food. The fisheries sector has provided jobs for about 2.20 lakh people, mostly from weaker sections of society. (Department of Fisheries, Government of Chhattisgarh.2023)

Methodology

Chhattisgarh is divided into three agro-climatic zones: Chhattisgarh Plains, Northern Hills, and the Bastar Plateau. For this study, the Chhattisgarh Plains were selected as the focus area. Among the 21 districts in this zone, Balodabazar district was chosen purposively due to its leading position in fish farming, with the highest area under fish culture and the highest production. The study is based on secondary data collected from various government sources, including the Department of Fisheries, Department of Agriculture, and the Directorate of Economics and Statistics, Government of Chhattisgarh. The data covers a period from 2013-14 to 2022-23.

Tools and techniques applied for analysis of data.

The secondary data was analysed for the compound growth rate using following formula.

Analytical Tools

1. Compound growth rate

$$Y = \alpha \beta^t$$

$$\log Y = \log \alpha + t \log \beta$$

Where,

Y = Area/ production /productivity of fish

α = Constant

β = Regression coefficient

t = time in year

$$\text{Compound growth rate (\%)} = (\text{Antilog } \beta - 1)100$$

2. Garret Ranking

$$\text{Percent position} = (100 - R_{ij} - 0.50) / N_j$$

where,

R_{ij} = Rank given for the i th item (1,2,3,.....,12) by the j th individual

N_j = Number of items ranked by the j th individual (1,2,3,.....,100)

Results and Discussion

Growth rate in area, production and productivity of fish

Compound growth rate of area production and productivity of fish has been presented in (table 1) and figure Balodabazar district exhibits strong growth rates, particularly at 3.03% for area, 13.11% for production, and -0.96% for productivity. It was concluded that the positive and significant growth was found in Chhattisgarh state and Balodabazar district. negative growth rate in case of fish productivity in balodabazar district. These figures highlight diverse regional agricultural dynamics to influenced by factors such as land management practices, technological advancements, and economic conditions, which shaping their respective growth in area, production and productivity in fish farming.

Table 1: Compound growth rate of area, production and productivity of fish in sampled district of Chhattisgarh State.

Particular	Compound growth rate		
	Area	Production	Productivity
Balodabazar	3.03*	13.11***	-0.96

Note:-* Significant 10% level probability of 't' distribution

** Significant 5% level probability of 't' distribution

*** Significant 1% level probability of 't' distribution

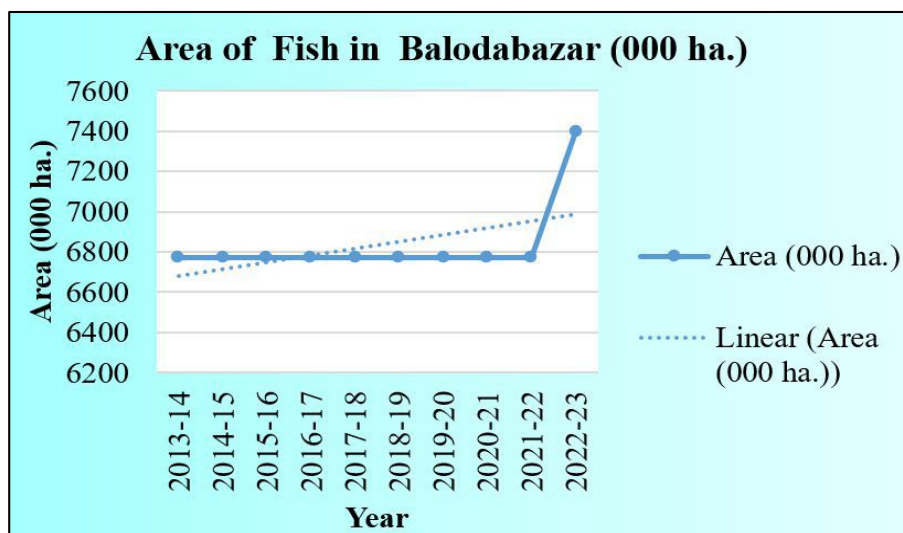


Fig 1: Area of fish in Balodabazar

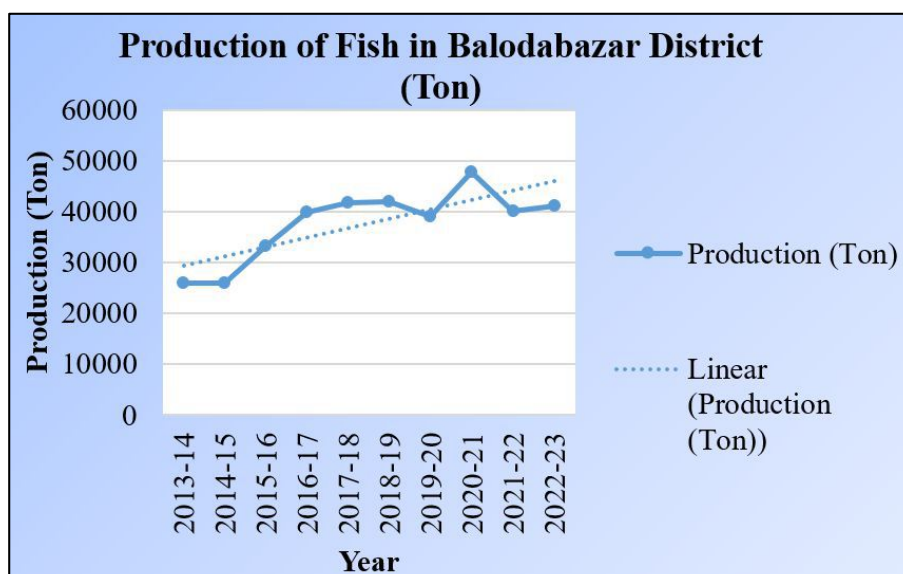


Fig 2: Production of fish in Balodabazar district

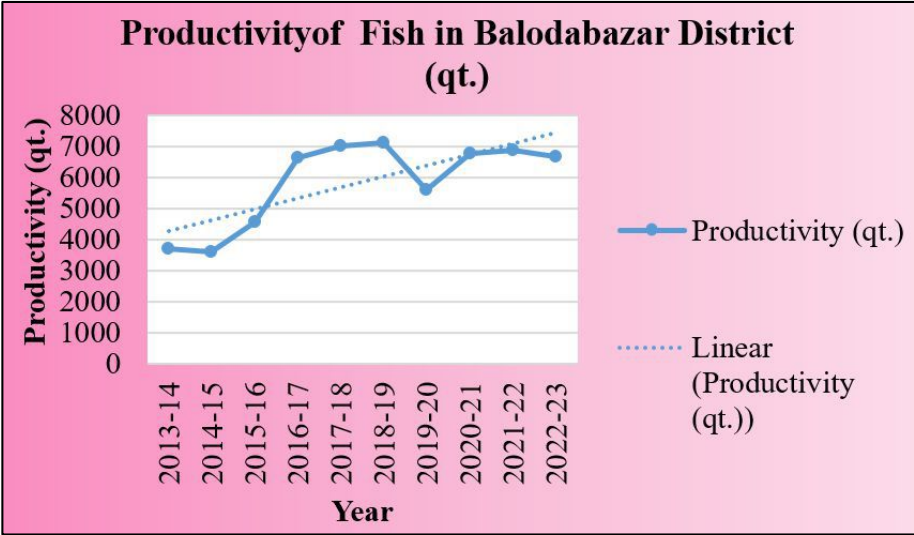


Fig 3: Productivity of fish in Balodabazar district

The constraints in production and marketing of fish in the Balodabazar District of Chhattisgarh State. Ranking and traits associated to Fish production and marketing in Balodabazar district of Chhattisgarh. (Table 2.) presents a detailed analysis of the various challenges faced by fish farmers in Balodabazar, ranked according to the mean value assigned to each issue by respondents. The higher the mean value, the more severe the problem is perceived to be. Each issue is given a rank (I to XII) based on this severity. The most serious issue is lack of quality fingerlings with a mean score of 56.38 (Rank I). They also heavily depend on middlemen for supplies (mean score 53.14, Rank II) and face frequent theft by local people (mean score 52.18, Rank III). Lack of knowledge about

proper feeding (mean score 51.48, Rank IV) Delayed payments by brokers (mean score 51.24, Rank V) Forced selling at lower prices (mean score 50.78, Rank VI) Restrictions on feed chemicals (mean score 50.16, Rank VII) Lack of cold storage facilities (mean score 49.70, Rank VIII) Lack of training on new technology (mean score 49.36, Rank IX) Inadequate support from banks (mean score 46.38, Rank X) Labour shortages during harvest (mean score 45.14, Rank XI) Fluctuating fish prices (mean score 45.06, Rank XII) These problems highlight the need for better input quality, market access, training, infrastructure, and financial support to improve fish farming in Balodabazar.

Table 2: Ranking and traits associated to Fish production and marketing in Balodabazar district of Chhattisgarh.

S. N.	Particulars	Balodabazar	
		Mean Value	Rank
1	Limited availability of quality fingerlings	56.38	I
2	Lack of proper training About latest technology	49.36	IX
3	Lack of knowledge about adequate feeding	51.48	IV
4	Problem of theft of fish by local People	52.18	III
5	Inadequate support from the bank officials	46.38	X
6	Some restriction (using feed chemicals) ‘faced in public ponds	50.16	VII
7	Compulsory Selling of fish at lower price to villages	50.78	VI
8	Non-availability of labour at the time of harvesting(catching)	45.14	XI
9	Lack of cold storage facilities	49.70	VIII
10	Fluctuation in price of fish	45.06	XII
11	Delay or irregularity in payment by brokers to fishermen	51.24	V
12	Dependent on middleman for supply	53.14	II

Conclusions

The compound growth rates of fish farming in Balodabazar district show strong positive trends in area (3.03%) and production (13.11%), but a negative growth rate in productivity (-0.96%). This suggests that while fish farming is expanding and total production is rising, the yield per unit area is slightly declining. The main issues affecting fish production and marketing in Balodabazar district are ranked based on their impact. The top problems faced by fish farmers include: Limited availability of quality fingerlings (Rank I) Dependence on middlemen for supply (Rank II) Theft of fish by locals (Rank III) Other important concerns include lack of proper feeding knowledge, delays in payments from brokers, and restrictions in public ponds.

Less critical but still relevant issues include lack of cold storage, price fluctuations, and inadequate bank support. These findings highlight the need to improve fingerling supply, reduce middleman dependency, and enhance security, along with better training, infrastructure, and support systems to boost fish farming in the district.

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