A STUDY ON CULTURE OF PANGASIUS IN THE EARTHEN PONDS OF SINGARAKONDA VILLAGE

By

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AUGUST 2021

DECLARATION

I declare that this thesis entitled **"A STUDY ON CULTURE OF PANGASIUS IN THE EARTHEN PONDS OF SINGARAKONDA VILLAGE"** is composed by me and has not been published or submitted in part or in full for award of any degree.

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Date : AUGUST 2021

Verified by

CERTIFICATE

This is to certify that the work incorporated in this project entitled, **"A STUDY ON CULTURE OF PANGASIUS IN THE EARTHEN PONDS OF SINGARAKONDA VILLAGE"** is the bonafide work carried out by **D.Mahesh babu** under our supervision.

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D. Mahesh Babu

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A STUDY ON CULTURE OF PANGASIUS IN THE EARTHEN PONDS OF SINGARAKONDA VILLAGE

INTRODUCTION

PANGASIUS PANGASIUS

SYSTEMATIC POSITION OF THE FISH

Kingdom:Animalia

Phylum:Chordata

Class:Actinopterygii

Order:Siluriformes

Family:Pangasiidae

Genus:Pangasius

Species:P. pangasius

Binomial name:Pangasius pangasius (Hamilton, 1822) Pic Source: FAO UN

Pangasius pangasius, the Pangas catfish, is a species of shark catfish native to fresh and brackish waters of Bangladesh, India, Myanmar, and Pakistan. It has also been introduced to Cambodia and Vietnam. This species grows to a standard length of 3 metres (9.8 ft). This species is important as a food fish.It is one of only two species of Pangasius native to South Asia, the other being P. silasi from the Krishna River.

Although Pangasius is mostly found in freshwater, it can live in salt concentrations of around 0.7 percent - 1 percent and alum water (PH >5) which can be tolerated at temperatures of around 30°C.

With a streamlined body, dark grey coloured back, silver belly, wide mouth and long twin beard, Pangasius has more red blood cells than other fish, an additional respiratory organ and can breathe through bubbles and skin. This means it is able to tolerate environments with little dissolved oxygen.

Its growth rate is rapid and it can live in the wild for as long as 20 years. After around 2 months during breeding, it reaches about 10-12cm long and 14-15 grams in weight.

By the age of 10, it can reach around 25kg in farming ponds, and those weighing between 800 - 1,100 grams after 6 - 8 months (not including the breeding stage) are best for harvesting.

Why pangasius?

Pangasius has a range of qualities that make it a suitable candidate for aquaculture. Its geographic range for potential culture covers areas with adequate water resources such as the global tropics.

More recently, aquaculture operations have moved to Ben Tre, Tien Giang and Vinh Long Provinces near the Mekong River's mouth where ecological conditions are favourable thanks to natural tidal movements twice a day and some large and small islands far from residential areas.

Production methods such as hormone induced spawning have allowed Pangasius aquaculture to develop rapidly and for the fish to become a globally important product. Areas such as hybridisation, genetic selection for positive production traits and increased introduction to suitable culture environments also appear to offer potential for further improvement, opportunities and development.

The fish's relatively low cost, mild flavour and delicate texture have allowed consumption to rise across the world. In the meantime, large-scale production in Vietnam and additional production by countries such as China have led to the marketing of Pangasius filets at low prices. This has significantly contributed to the fish's rapid growth and acceptance on world markets.

The culture of Pangasius

Primarily reared in ponds and cages, Pangasius is usually stocked at high densities (around 60 -80 fish per m2) and grown for around 6- 8 months before reaching its harvest weight of around 1kg.

Males and females grow at similar rates, with the reproduction temperature between 26 and 28°C.

The spawning period is between February and October, with the age of sexual maturity known to be 3 - 3.5 years.

Pangasius are also highly fecund; females can produce up to 80,000 eggs/kg and can be spawned several times. Pond production can lead to yields of around 250 - 300mt/ha, more than 4 times that of other aquaculture species.

Cage production occurs in impoundments, lakes or rivers, and stocking densities tend to be around 100 - 150 fish/m3 and yields from around 100 - 120kg/m3. Floating cages also help maintain continuous water exchange and allow higher fish densities and productivity.

Pangasius tends to be exported as skinless, boneless fillets, and its flesh colour will vary from white, cream, yellow or rose depending on feed, processing, culture conditions and the environment.

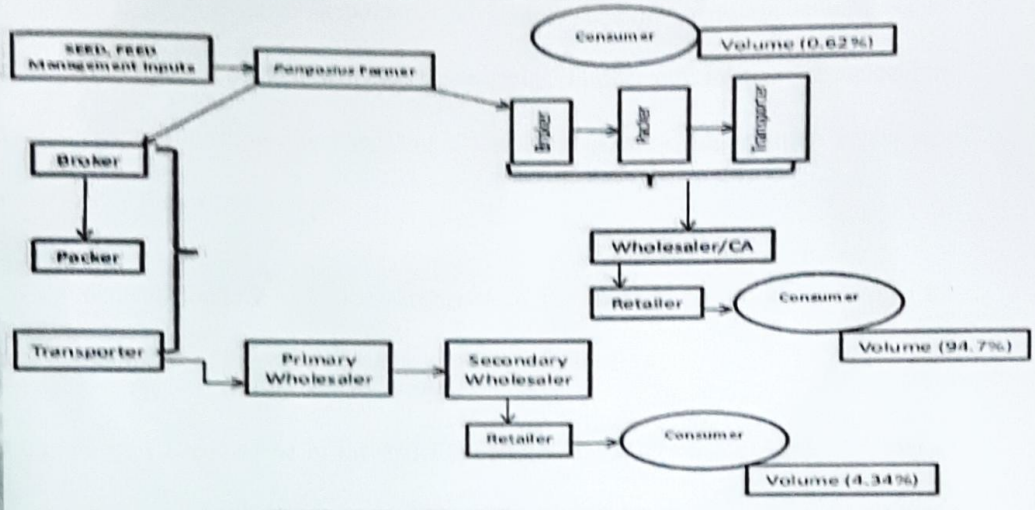


Fig. 1.0 *Pangasius* Supply Chain in India

Floating feeds and good water quality lead to white fillets, while yellow flesh is said to come from non-commercial or natural food sources.

Pangasius by-products are also used in various applications such as fishmeal, bio-diesel and cosmetics, and because the flesh has a medium firm fine-grained texture and mild flavour, it's also suitable for a range of value-added products.

The culture of Pangasius has faced some issues concerning environmental impact. For example, the collection of fry from the Mekong River reduced natural fisheries and impacted on other species, but this problem is being addressed through home spawning techniques as well as governmental restrictions on collecting fry and harvesting wild stocks.

Today, farms are obliged to provide information on any possible environmental impact before farming operations can begin.

Pangasius exhibits a range of potential advantages in terms of reproductive capacity, resistance to low dissolved oxygen and production yields. Further development of aquaculture standards will help define how the Pangasius aquaculture industry can improve further and secure a sustainable future.

As the demand for safe and sustainable seafood continues to go up, it's likely that the culture and consumption of Pangasius could become more mainstream.

Pangasius has become one of the major species of freshwater fish cultured for internal consumption, and will continue being an important contributor to the country's growing aquaculture production.

For India, the second-most populous country in the world, food security is a major concern to support the health of its people. The country has enjoyed economic growth in recent years, and fishing and fish farming have been important economic activities for many years, significantly contributing to the country's gross domestic product, or GDP.

India's aquaculture industry has developed over the years, overcoming several challenges (including disease outbreaks), to become a significant contributor to the world's seafood trade

and aquaculture production. Today, the country is an important trade partner to the major importing countries of the world such as the United States, Japan, China and throughout Europe.

The major cultured species are the Indian major carps (catla, rohu, mrigal), silver carp, common carp, grass carp (Chinese carp), marine shrimp (Litopenaeus vannamei, Penaeus monodon), giant freshwater prawn and others.

Some species have been introduced to promote species diversification, development and adoption of new production technologies to help meet productivity challenges, help manage disease outbreak issues, to supply animal protein to an increasing population, to help the country's seafood exports to remain competitive in international trade, and to generate foreign currency. The main introduced species that are currently cultured include pangasius (Pangasionodon hypophthalmus), Pacific white shrimp (L. vannamei) and tilapia.

The increasing demand for seafood in its domestic markets are promoting and strengthening the production of species like pangasius, which can fetch INR 150 to 200 ($2.34 to $3.11) per kg on the local markets.

Pangasius was introduced in India during 1995-96 from Thailand through Bangladesh. Sturdy nature and its compatibility to polyculture made this fish popular for aquaculture. The Pangasius, has emerged as one of the major candidate species in freshwater aquaculture system of Andhra Pradesh. Andhra Pradesh is also the largest farmed– fish producing state in the country. Fish farmers of Andhra Pradesh have initiated the pond farming of Pangasius since the year 2004, with a view to diversify their carp-based aquaculture, and to harness its high yield potential for domestic as well as export market. Andhra Pradesh produces more than 0.5 million tonnes of Pangasius per annum from 32000 ha of pond area, with productivity of 12.5 to 50

tonnes/ha/year.14 The Pangasius produced in Andhra Pradesh is ice-packed and transported to consumer markets in West-Bengal, Maharashtra, Bihar, Uttar Pradesh, Delhi, Assam and in some other North-Eastern states. As compared to the well-established consumer markets of the Indian major carps, the markets for the Pangasius are very limited. Supply chain analysis is important in order to know the flow of Pangasius in the domestic native markets as well as distant market in India. Efficient supply chain satisfies both consumer and producer. This article intends to delineate the supply chain by exploring distribution channel, communication networks and price spread in Pangasius supply chains. This delineation critically reflects on what is the domestic market structure and how the Pangasius is traded domestically, kind of communication flow and wealth distribution among intermediaries

Andhra Pradesh majorly trade Pangasius to West Bengal, Maharashtra, Assam and Haryana. Majority of the produce is marketed to the distant markets. Direct disposal to consumers was negligible which reflects limited demand for Pangasius. Three major distribution channels were identified. The actors in supply chain earning considerable margin/profit with respect to their role in the transaction. This has sustained their interest in the supply chain. Marketing intermediaries found were, a) Primary actors; Fish Farmer/Producer, Wholesaler, Secondary Wholesaler, Retailer and consumer b) Supporting actors; Broker, Packer, Transporter, Commission agent and Ice provider. The under-reporting of price by brokers or other intermediaries will affect the farmers share in consumer rupee. The entrepreneurial efforts of these actors has significance in the marketing work. This paper explored the movement of Pangasius in the existing marketing system with the present information flow to destined markets in the presence of margin seeking intermediaries. This has brought to our attention that we need to promote the Pangasius in the home state, explore other distant markets like Punjab, Jammu &

Kashmir, Chhattisgarh, for the Pangasius demand. Improve content of information flow, study the constraints faced by actors if any, reduce price spread with efficient marketing so that ultimate consumer relishes the taste of this delicious cat fish. This development needs better support through modern market facilities and huge consumer base domestic or abroad to absorb the produce.

Biology Glossary (e.g. epibenthic)

Found in large rivers and estuaries. Occurs in high estuary (freshwater tidal zone) as juveniles, moving to brackish water as sub-adults, and finally as adults to river mouths and inshore areas. Longevity given as 10 years but appears too low. Feeds on snails, other mollusks and plants. Reared for consumption in Thailand, Cambodia and Vietnam; excellent food fish with very white fine grained sweet flesh

OBJECTIVES:

1. To know the species of cultured fish used

2. To know the feed used for culture of fish

3. To understand the status of the aquaculture in the specified area

4. To know the diseases that may occur in the cultured species of the specified area

5. To estimate the amount of expenditure incurred

MATERIALS & METHODS

The study area has been chosen at Singarakonda, Addanki. The ponds with fresh water *Pangasius* were chosen for the study. Two ponds with same stocking density and feeding protocol were chosen. The ponds of the size 1 acre were selected for culture of Pangasius.

The first pond with 50 cents was used as nursery pond and the second pond with 1.5 acres was used as stocking pond were selected for our study

The ponds were visited in different seasons to know the status of culture of Pangasius

We enquired about the feeds used and the medicines used to treat the various diseases that may occur during the culture period

RESULTS AND DISCUSSION:

The ponds were visited seasonally. The seed was purchased from the registered traders and was introduced into the nursery pond and after attaining the size of fingerlings stage they were transferred unto stocking ponds for further culture. The fries were maintained in nursery ponds for about 10 to 12months and later in stocking ponds for about an year or one and half year.

The fries were fed with rice bran and grounded grains and the stocking pond be provided with fillets as feed

If affected with diseases, the ponds be provided with the antibiotics/ medicines

Short description Morphology | Morphometrics

Dorsal spines (total): 2;

Dorsal soft rays (total): 7;

Anal spines: 0;

Anal soft rays: 29 - 32.

Eye small, its diameter more than 7 times in head length (in 18 cm long specimens);

bright yellow caudal fin in adults;

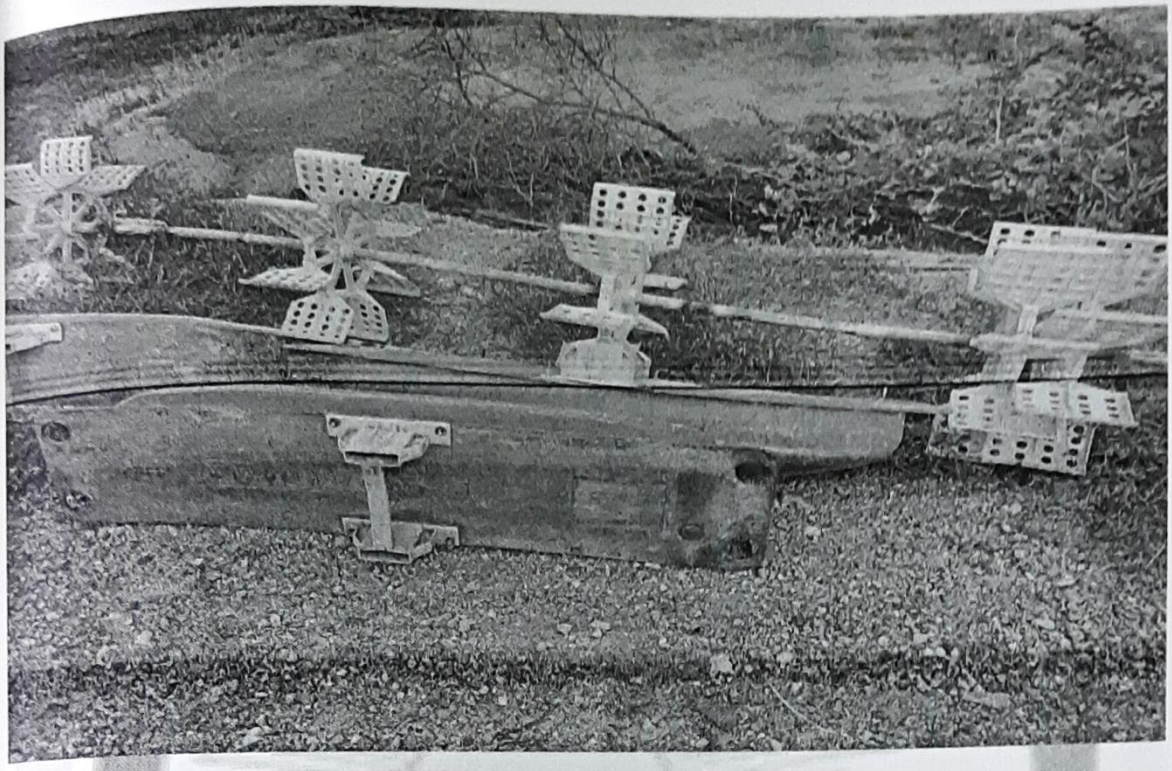
maxillary barbel extends to gill aperture;

23-28 gill rakers on first arch.

The nursery pond

The ponds of the selected area where the selected species were cultured

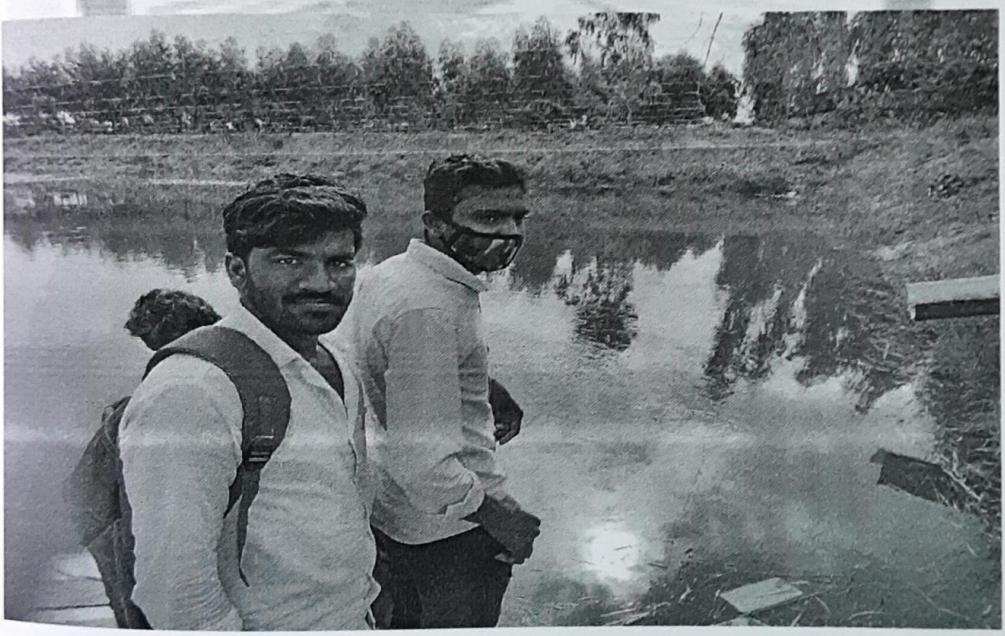
The stocking pond



The aerators used to increase the DO(Dissolved Oxygen)

The feed distribution to the pond

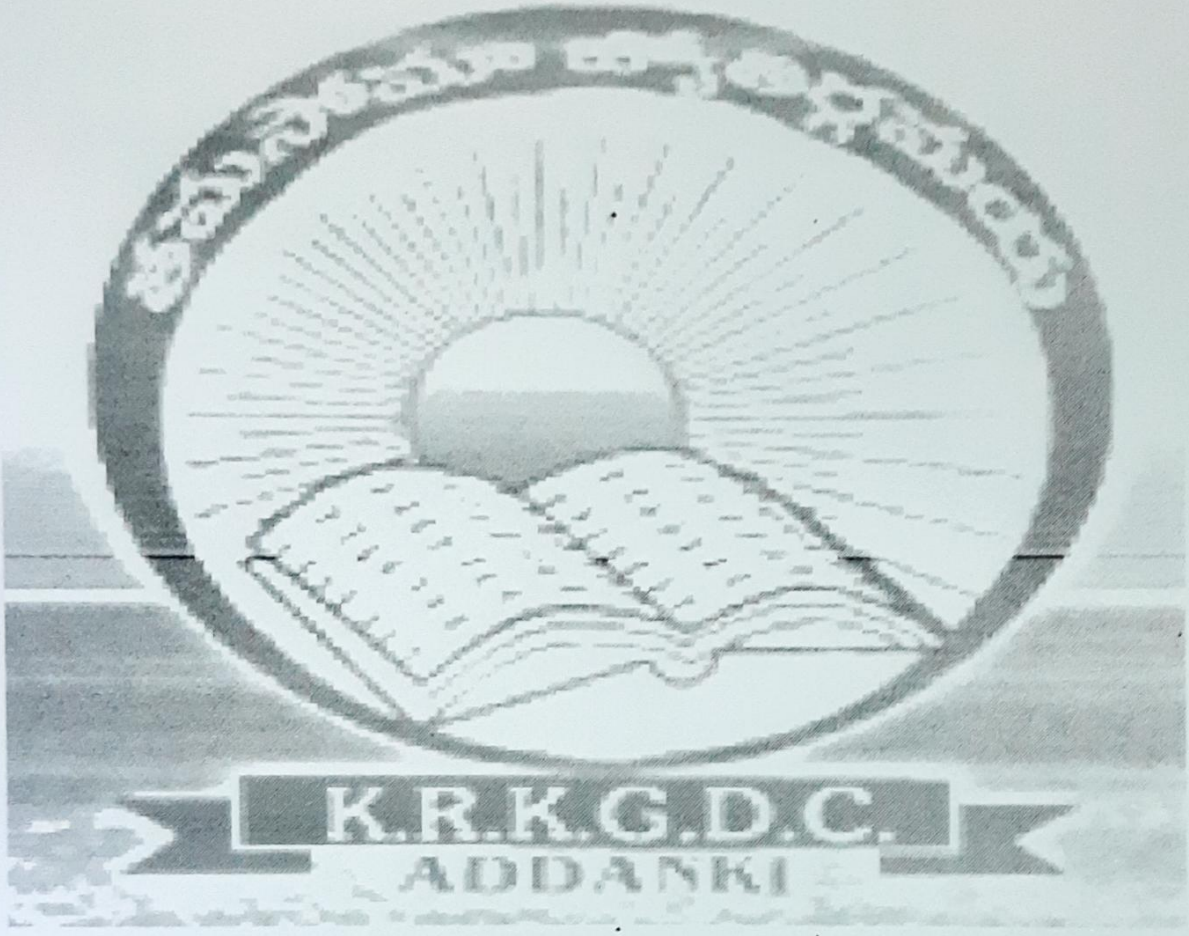
Introduction of seed to the nursery ponds



The fencing network as a protect against birds

SUMMERY AND CONCLUSION:

The culture ponds selected were used to culture the fish species of Pangasius and the investment for the culture was estimated to approximately 4-5 lacs per acre and the expected outcome may be around 8 lacs per acre with a profit of 2-3 lacs. If subjected to any diseases the expected income may fall and sometimes may subjected to even losses.



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