

Makhana Processing and Marketing in Bihar

Dr. Ranjan Kumar Sinha

Sr. Research Officer

Agro-Economic Research Center for Bihar & Jharkhand

Tilka Manjhi Bhagalpur University, Bhagalpur – 812007

Mob. No.9065606956

Abstract

Makhana (*Euryale ferox*), an important aquatic cash crop is unique, highly nutritious dry fruit mainly grown in stagnant perennial water bodies, like ponds/jalkars, land depressions, oxbow lakes, swamps, ditches and low-lying agricultural fields. It has tremendous potential to support the livelihood of resource poor farmers, particularly belonging to the fisherman/mallah community in the Eastern region of India, where agriculture is by and large diverse, complex and risk prone. It is considered as a native of South-East Asia and China. In India, it has a fair distribution in North-Eastern and Eastern Regions, Jammu & Kashmir. The country produces 90 per cent of the world production; however, its commercial cultivation is confined to northern Bihar. In Bihar, Makhana is mainly cultivated in the flood prone areas' of Mithilanchal, Kosi and Seemanchal regions of the state, accounting for 90 per cent of India's total Makhana production. It's about Rs. 250 crore market at farmers' end, Rs.550 crore at traders' end and Rs. 1500 crore at consumers' end. Makhana is a crop that under goes 100 per cent processing and the entire system of processing is manual till date, which is carried on through generations from time immemorial. Most of the experts of this technology belong to the women population of a specific community of 'mallah' of north-Bihar. Natural concentration of these experts is limited to a few areas of north-Bihar particularly in Darbhanga and Madhubani districts and that is the only reason, that the processing of Makhana is restricted to Bihar only. After processing, popped Makhana is sold to local and distant markets. But the Makhana supply chain is lengthy as there are many market functionaries between the farm gates to end product markets.

Key Words- Land depressions, oxbow lakes, swamps, ditches, immemorial, processing, popped Makhana

Introduction

Euryale ferox Salisbury (Makhana), an important aquatic minor crop, has tremendous potential to support the livelihood of resource poor farmers, particularly belonging to the fisherman/mallah community in the Eastern region of India, where agriculture is, by and large, complex, diverse and risk prone. It has a fair distribution in North-Eastern and Eastern Regions, Jammu & Kashmir, however, commercial cultivation is confined only in the northern part of Bihar. In order to tap the potential of seasonal water bodies of Eastern and North-Eastern regions, Makhana cultivation offers a unique opportunity. It is a cash crop and marketed in the form of popped Makhana commonly known as Makhana lawa. India produces 90 per cent of the world production of makhana.

In Bihar, Makhana is mainly cultivated in the flood prone areas" and is an important crop of Mithila and Kosi- Seemanchal regions of the state. Its cultivation is highly tedious, cumbersome, labour intensive and involves human drudgery. Bihar is a leading producer of Makhana, accounting for 90 per cent of India"s total production. Of the 38 districts in Bihar, Makhana is largely cultivated in 09 (*nine*) districts namely; Sitamarhi (*Tirhut Division*), Darbhanga & Madhubani (*Darbhanga Division*), Saharsa & Supaul (Kosi Division) and Araria, Kishanganj, Purnea & Katihar (*Purnea Division*). These districts are in north-eastern part of Bihar and lie sequentially in Mithilanchal, Kosi and Seemanchal regions and Agro-climatic zones – I (North-West Alluvial Plain) and II (North-East Alluvial Plain) respectively of Middle Gangetic plain region. In absence of a reliable database, the area under Makhana cultivation till the 1980s was estimated at 10,000 hectare, which has now increased to 35224 hectare in 2021. The seed and pop production are 56389 tones and 23656 tones respectively in 2021-22. The estimated value of production at farmers" end in 2020 was estimated at Rs. 250 crore and the generated revenue at Rs. 550 crore at the traders" end. Makhana is a crop that goes under 100 percent processing and the entire system of Makhana processing is manual till date, which is carried on by the generations from time immemorial. The popping process is highly skilled, tedious, time consuming and painstaking. Most of the experts of this technology belong to the women population of a specific Mallah community of north Bihar. Natural concentration of these experts is limited to a few parts of north Bihar particularly in Darbhanga and Madhubani districts and that is why the processing of Makhana is restricted to Bihar only. After processing Makhana pops are sold to local and distant markets situated across the country. Major markets of Makhana seeds in Bihar are Darbhanga, Madhubani, Katihar and Purnea while the major markets for processed Makhana outside the state are in Delhi, Varanasi, Kanpur and Indore. But the Makhana supply chain is lengthy as there are many market intermediaries between the farm gates to the end product markets.

The year 2014 was a game changing year for the Makhana sector when the Prime Minister in the course of Parliamentary Election campaigning vowed to boost Makhana cultivation, processing and marketing. Subsequently initiatives made by the Government of India and Government of Bihar have helped the Makhana sector in ramping up production with marketing and strengthening the farmers. Further in 2020 out of the major economic package of INR 20 lakh crores made under the *Atmanirbhar Bharat Abhiyaan* during the COVID – 19 pandemic, a Scheme of Rs. 10,000 crores was announced for Micro Food Enterprises (MFEs) to promote „vocal for local with global outreach.“ Under the Scheme Makhana was one out of six selected producers. In August, 2022 Government of India awarded the Geographical Indication (GI) tag to Mithila Makhana. It led to extending of Makhana Vikas Yojana in 11 districts, spread over Kosi-Seemanchal and Mithilanchal regions of Bihar. Under the scheme, the Government of Bihar provides financial assistance @ Rs. 72750/ hectare for area expansion. All these efforts brought happiness to Makhana growers as the prices of Makhana were highly remunerative till 2021 but thereafter it again fell tremendously.

As per latest available data, the area under makhana cultivation in Bihar has increased from 13000 ha in 2012-13 to 35224 ha in 2021- 22, registering an increase of 270 per cent during last nine years. Similarly the seed production increased from 20800 tones to 56389 tones and pop production from 9360 tones to 23656 tones during the same period, registered an increase of 271 and 253 per cent respectively. The average yield rate of makhana seed production was estimated at around 16 qtl. per ha during the period. The recovery rate of makhana pop was found to be 41 to 45 per cent.

In regard to the marketed surplus, APEDA"s estimates (2017), data reveals that about 50,000 MT of makhana is nearly 48 per cent of the total cost in the traditional ponds system and 41 percent of the total cost in the field system. These were followed by nearly 38 percent of the cost on leasing of ponds/lands in both the systems of cultivation of makhana. These two components alone occupied 87 percent and 80 percent respectively of the total cost of cultivation.

The output was estimated at 7.55 quintal per acre in the traditional pond system and 8.48 quintal per acre in the field system. On an average the selling price was reported to be Rs. 7950 per

quintal of makhana seeds, which was almost half as compared to the last year's peak price.

On an average, the cost of processing in the traditional manual system was estimated at Rs. 2575 per quintal of Makhana seeds and out of the total processing cost, labour charge alone constitutes about 70 percent. The average recovery rate of makhana pops from out of makhana seeds was 44.25 kg per quintal.

There are 03 marketing channels for marketing of Makhana, as identified in the study area. These are as below:

- i. Producer --- Aggregator --- Processor (Phodia) --- Local Wholesaler /Trader --- Distant Wholesaler --- Retailer --- Consumer.
- ii. Producer---Processor (Phodia) --- Local Wholesaler/ Trader/ Commission Agent --- Wholesaler (Distant or Regional)--Retailer-- Consumer
- iii. Producer --- Processor (Phodia) --- Trader --- Retailer--- Consumer.

Channel wise estimated volumes of disposals was 70-80 percent through channel – I (Distant Markets), 20-25 percent through channel – II (Regional Markets), and 10-15 percent (local Markets) through channel - III.

The producer's share in consumer's rupee was 38.19 percent in channel – I, 34.20 percent in channel – II and 40.58 percent in channel – III, meaning thereby the price spreads were 61.81 percent, 65.80 per cent and 59.42 percent of the retailer's price respectively.

For measuring Marketing efficiency in Makhana, four alternate methods were worked out. The traditional method suggests that channel – II was more efficient than other channels but the price received by the producer in this channel was the lowest, so this is not suitable. In *Shepherd's method*, as suggested channel – III was more efficient but it did not consider the price received by the producer. According to the modified marketing efficiency channel – II was more efficient but the margins of market functionaries as compared to marketing cost were very high. *Acharya suggests* channel - II followed by channels I & III is more efficient.

The figures on the borrowing status of the sample growers reveal that altogether 114 growers (57%) borrowed from different sources and average amount of borrowings and outstanding were Rs. 15893 and Rs. 10663 (67% of the borrowings) respectively. About 88 percent of the borrowers borrowed from the non- institutional sources.

The production related constraints, as perceived by the sample cultivators, use of traditional cultivars was the *Garret's* fast rank constrain. This was followed by uncertainties in profit due to short term settlement of jalkar and renting of field, lack of working capital due to weak economic status of cultivators, drudgerous & costly harvesting, climatic stress, lack of irrigational facilities, numerous inefficiencies in distribution of jalkar, siltation or sand filling of beds of water bodies, lack of technical interventions, health risk to women and children and infestation of aquatic weeds.

Among the processing constraints, lack of mechanical processing was the *Garret's* first rank constraint followed by lack of processing cluster or common facility centre, lack of ready to consume local market, drudgery activity, high dependency on traders, small size of output, low demand due to less popularity of the produce, weak socio- economic conditions of processors, lack of infrastructural facilities, migratory life and lack of subsidies on machines, etc.

The makhana marketing system has been well organized in the hands of a few big traders, who dictated the price and earned a lot at the cost of poor farmers. Among the marketing constraints; due to lack of local demand farmers were completely dependent on organized traders for disposal of their output, followed by formation or cartel by market entities, determination of prices on will and wishes of the wholesalers, lack of makhana mandies in the state, high transportation cost lack of infrastructural support, lack of branding initiatives for makhana and its value added products, being a minor crop hindrance in export, imposition of GST and absence of terminal market in the state.

While recognizing the immense scope of development in production, processing and marketing of makhana in Bihar, selected stakeholders' views have been captured as Case Studies.

These stakeholders are Producer---Cum---Trader, Processor---Cum---Trader, Trader and Primary Processor/Phodia. The interactions with these selected stakeholders revealed their operational pattern, constraints and solutions as well, which are briefly presented in boxes of chapter – III.

Suggestions

The study recognizes the immense scope for development in production, processing and marketing of makhana and thus, on the basis of primary survey, observations and discussions with the stakeholders following interventions are required in the area of production, processing and marketing:

Production

- Popularization of improved varieties of seeds released so far (*Swarna Vaidehi & Sabour Makhana – I*) for commercial cultivation should be made available adequately to increase the production. And for this, there is need for seedlings preparation at the farmers' level for replacing local/landraces.
- To reduce the requirement of human labour and drudgery involved in harvesting R & D programmes should be focused on crop improvement and affordable & efficient Makhana harvester.
- Leasing of jalkars should strictly be made in accordance with the **Bihar Fish Jalkar Management Act, 2006** and the minimum tenure of distribution of jalkar at the village level should be 3 to 5 years and patta should be in written form so that the allottee could get the Kisan Credit Card (KCC) facility.
- Cleaning and siltation of jalkars/ponds/water bodies should be made at regular intervals along with irrigation facilities particularly in Kosi-Seemanchal regions (ACZ – II) so that minimum level of standing water could be maintained for this aquatic crop.
- Scientific and technical interventions, such as training for management of weeds and pests, seed coat, SOP in adoption of improved varieties of seeds etc. should be made.

Processing

- To minimize wastage, reduce skilled labour requirement and get rid of drudgerious activity; mechanized processing is the need of time. Machine is already invented, trailed and updated but not adopted. It requires promotion to institutions like CIPHET (Ludhiana), BAU (Sabour, Bihar) and ICAR"s---Research Centre for Makhana, Darbhanga, Bihar and other interested entrepreneurs on R & D in popping, roasting and other machines; besides subsidization of machines.
- Processing Clusters and Common Facility Centres at some important Makhana hubs/locations should be established for redressal of bottlenecks such as dependency on traders, weak socio-economic conditions of the processors, marketing inefficiencies, lack of standardized and hygienic produce etc.
- Promotion for value addition support to Makhana industries is required, as Makhana takes more space leading to high transportation cost, loss of tax revenue etc. Processing and value addition such as; Makhana powder, flakes, soup, candies, kheermix, snacks etc. will increase its value manifold; and will thus be advantageous for **GI tagged monopoly produce of Bihar**.

Marketing

- Need to create mass awareness about high nutritional value of the produce, as Makhana is still considered a primitive minor crop with limited consumption across the states and foreign markets.
- There is a need for marketing linkage and brand promotion as marketing is a real challenge in today's world. In-depth understanding of the market needs is required, which can be achieved by strategic market linkages (backward & forward), product innovation and standardization of the products.
- Demand for organically grown produce is growing rapidly and Bihar's Makhana is almost

grown organically so, if quality certification of the produce is done, the produce may be sold at premium price.

- Makhana markets are controlled by cartels of market entities which can be undone by organizing FPOs and approaching the non- conventional markets. This will be instrumental in increasing the demand of Makhana, making its market larger and competitive.
- Popularization of Makhana is needed for increasing the demand at all levels. It necessitates participation of Makhana FPOs & entrepreneurs in exhibitions, fairs, meets/conclaves etc.
- To enable market discovery price, which is less evident in the Makhana marketing system--- financial dependency of the cultivators and processors need to be minimized. It will also promote the cultivators in Makhana value chain and enhance farmers' integration with the market.
- Infrastructural support like; allotment of separate HS Code for export, subsidized freight rate for transportation through Railways, establishment of Makhana mandies in Bihar, storage assistance, promotion to Makhana food industries etc. is highly required.

References

1. Pushyamisra (2021). Bihar farmers take up makhana farming to cope with weather constraints. Retrieved from www.india.mongabay.com/dated 25 March 2021.
2. Kumar, Anil (2021). Brics countries seek tips on Makhana cultivation, Bihar experts on job. Statement published in Hindustan Times (dailies) dated 26/06/2021.
3. Govt. of Bihar (2020). Model detailed project report-Makhana Processing, prepared by Directorate of Horticulture, Government of Bihar.
4. Govt. of Bihar (2023), Bihar Makhana--- at a Glance, Directorate of Horticulture, Patna.
5. Indian Express (2020). People involved in Makhana production hoping to see better days in Bihar. Published on 20th May.
6. APEDA (2017). APEDA Export strategy-Part-II-Focus products.
7. Choudhary, J N; Prakash, O; Jha, P K & Jha, O N (2003). Economic Analysis of Production and Marketing of Makhana in Bihar. Published in MAKHANA (eds) by R K Mishra, V N Jha & P V Dehadrai, ICAR, New Delhi; 2003.
8. Mahawar, H K (2016). Quoted in Report on Makhana (Fox nut) Production, Processing and Supply Chain from A study on Dynamics of Marketing of Selected Fruits in Bihar, Bihar Institute of Economic Studies, Patna, Bihar authored by S P Sinha (retrieved from <http://agmarket.nic.in/respro3.htm#Project5>). www.makhana.org
9. Kumar, Anil; Yadav, Pankaj Kumar; Nath, Paras; Patel, V B & Kumar, Rajesh (2020); Sabour Makhana – 1: A New Variety, Indian Horticulture, Vol. 65, No 2.
10. Patel, V B; Kumar, Anil; Patil, Shridhar; Rahman, S M (2017); An unpublished report on An Analysis of Makhana value chain to enhance farmers integration with market (submitted to NIAM, Jaipur); Bihar Agricultural University, Bhagalpur, Bihar.
11. Acharya, S S & N L Agrawal (2001); Agricultural Marketing in India (3rd Ed.), Oxford and IBH Publishing Company Pvt. Ltd; New Delhi.