

3. Makhananomics – Economy

Prime Minister Narendra Modi described the newly launched National Makhana Board as a transformative “revolution” for the sector.

Makhana – Overview

1. Botanical and Ecological Profile

Scientific Name – *Euryale ferox*

Common Names – Fox nut, gorgon nut, or prickly water lily seed.

Family – Nymphaeaceae (Water lily family).

Habitat – Grows naturally in stagnant water bodies like ponds, wetlands, and lakes – primarily in tropical and subtropical Asia.

Physical Features – Recognized for its large, prickly, circular leaves that can spread over a meter across the water surface. The plant bears violet and white flowers that bloom above the water surface. The edible seeds, enclosed in prickly pods, are the main economic product after being dried and popped.

2. Cultural and Nutritional Significance

Traditional Uses – Makhana has deep cultural roots in Indian rituals, fasting, and Ayurveda. It is consumed during Hindu fasting periods (vrats) as it is considered a ‘satvik’ (pure) food. Traditionally used in Ayurvedic formulations for managing ailments like kidney disorders, heart weakness, and reproductive health issues.

Nutritional Value

Rich in – Protein, carbohydrates, magnesium, phosphorus, potassium, and fibre.

Low in – Fat and sodium, making it a low-calorie superfood.

Health Benefits – Supports digestion and weight management. Acts as an antioxidant and anti-aging food. Regulates blood pressure and cholesterol levels. Gluten-free and suitable for diabetic-friendly diets.

Global Appeal – Promoted internationally as a vegan, plant-based snack alternative to processed foods.

3. Production and Geographical Distribution

India’s Leading Producer – Bihar

Dominant Region – The Mithilanchal belt in Bihar contributes nearly 90% of India’s total makhana output.

Key Districts – Darbhanga, Madhubani, Purnea, Katihar, Supaul, Araria, and Sitamarhi.

Cultivated Area – About 15,000 hectares under makhana cultivation.

Annual Output – Nearly 10,000 tonnes of popped makhana (ready-to-eat) produced annually.

Global Scenario – Apart from India, makhana is also cultivated in Nepal, China, Japan, and Korea, but India leads in both area and production. The global makhana market was valued at USD 43.56 million in 2023, projected to cross USD 100 million by 2033, indicating rapid export potential.

4. Issues and Concerns in the Makhana Sector

a. Low Value Realization – Bihar, though the major producer, lacks organized processing facilities, export hubs, and cold-chain logistics. Consequently, raw fox nuts are sold at lower prices to states like Punjab and Assam, which process and export them, gaining higher profits.

b. Market Intermediaries – The supply chain is fragmented with multiple middlemen between farmers and exporters. Farmers receive only a small fraction of final consumer prices, leading to limited income gains.

c. Lack of Processing and Branding – Most farmers sell unprocessed makhana; branding, packaging, and value addition remain underdeveloped. Absence of organized cooperatives or farmer-producer organizations (FPOs) reduces bargaining power.

d. Labor-Intensive and Low Productivity – Traditional harvesting and popping methods are manual and time-consuming, involving high drudgery. Productivity is low (approx. 700 kg/ha) due to inadequate mechanization and poor water management.

e. Climate and Environmental Challenges – Makhana requires stagnant water bodies with specific pH

and depth; climate variability, pollution, and shrinking wetlands threaten its ecological niche. Lack of scientific aquaculture practices affects yield and sustainability.

5. Government Initiatives and Policy Support

a. GI Tag for Mithila Makhana (2022) – The Geographical Indication (GI) tag was granted to Mithila Makhana in 2022, recognizing its unique geographical and cultural identity. This enhances market value, prevents counterfeit branding, and ensures exclusive branding rights to Bihar's producers.

b. Establishment of the Makhana Board –

A **Makhana Board** is being set up to –

1. Promote research and innovation in makhana farming and processing.
2. Facilitate better marketing linkages and export promotion.
3. Develop standardization and quality certification systems.

c. Industrial and Marketing Promotion – The state government, under its Industrial Investment Promotion Policy, includes makhana-based processing units under the agro-industrial category. Focus on cluster-based development and export-oriented processing units. Branding campaigns highlight “Mithila Makhana – The Superfood from Bihar.”

d. Support under National Mission on Edible Oils and National Horticulture Board – Makhana is recognized as a nutraceutical and high-value crop, eligible for support under horticulture and agri-business schemes.

6. The Way Ahead – “Makhananomics” And Rural Transformation

a. Vision of Makhananomics – Refers to an integrated rural economic model centered around makhana production, processing, and export. Aims to achieve rural empowerment, women's employment, and inclusive value-chain development.

b. Infrastructure Development – Setting up food processing parks, cold storage units, grading and packaging centres, and export hubs near major cultivation areas. Integrating makhana clusters with PM Formalisation of Micro Food Processing Enterprises (PM-FME) and One District One Product (ODOP) schemes.

c. Farmer Empowerment – Formation of FPOs and cooperatives to enable collective bargaining, standardized pricing, and improved market access. Introducing training programs and mechanization to reduce labour dependence and improve yield efficiency.

d. Research and Innovation – Promoting scientific aquaculture-based cultivation techniques in collaboration with ICAR-National Research Centre for Makhana (NRM), Darbhanga. Development of high-yielding, disease-resistant varieties and eco-friendly popping machines.

e. Global Branding and Export Strategy – Positioning makhana as an organic, vegan, and gluten-free superfood in international markets. Expanding exports to the US, Europe, Japan, and Middle East, leveraging the “Make in India – Eat Healthy India” brand.

7. Environmental and Social Impact Potential

Wetland Conservation – Makhana cultivation can incentivize wetland restoration and waterbody conservation, particularly in flood-prone North Bihar.

Women Empowerment – Makhana processing involves high female participation, particularly in cleaning, sorting, and popping stages.

Inclusive Growth – Integrates agriculture, aquaculture, and food processing – creating a diversified livelihood ecosystem.

8. Conclusion – Makhana exemplifies a traditional food system transitioning into a modern superfood economy. With targeted interventions – in processing, branding, research, and export facilitation – Bihar can evolve from a raw material supplier to a global leader in the makhana value chain. The vision of “Makhananomics” reflects a sustainable rural development model that aligns with SDG 8 (Decent Work and Economic Growth) and SDG 12 (Responsible Consumption and Production).

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