



Millets as Superfoods: Unlocking Nutritional and Economic Potential in India

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INTRODUCTION

Millets, often referred to as “miracle grains” or “smart foods,” are a group of small-seeded grasses belonging to the botanical family *Poaceae*. Known for their exceptional drought tolerance and climate resilience, millets have long been cultivated as an important source of food and fodder for millions of resource-poor farmers. Their ability to thrive in drylands with minimal irrigation makes them a sustainable alternative to water-intensive crops, while also contributing significantly to ecological balance and economic security. Traditionally regarded as “coarse cereals” or the “poor man’s cereal,” millets are now being rebranded as nutrient-dense superfoods, rich in iron, zinc, fiber, and other essential micronutrients that help combat malnutrition and diet-related diseases. Their versatility and nutritional profile not only support healthier diets but also provide opportunities for smallholder farmers to enhance their livelihoods. In this context, promoting millet-based smart foods is not just about strengthening the agricultural sector, but also about ensuring food security, reducing environmental stress, and paving the way towards a sustainable and healthy world.

Classification of Millets

Millets are broadly classified into two categories as follows:

1. **Based on Growing Season-** The millets are categorized into two based on the growing season as:
 - **Kharif millets** – Grown during monsoon (e.g., Pearl millet, Sorghum, Finger millet).
 - **Rabi millets** – Grown in winter (e.g., Little millet, Proso millet).
2. **Based on Nutritional Value-** The millets are categorized into following categories based on the nutritional value:
 - **Energy-rich millets** – Sorghum, Pearl millet.
 - **Protein-rich millets** – Finger millet, Foxtail millet.
 - **Mineral-rich millets** – Barnyard millet, Kodo millet.

Benefits of Millets as Smart Food

Millets are increasingly being recognized as “*smart foods*” because they are good for people, good for the planet, and good for farmers. Their diverse benefits span nutrition, health, environment, and livelihood security.

1. Nutritional Benefits (Good for People)

- **Rich in Nutrients:** Millets are packed with proteins, dietary fiber, vitamins (especially B-complex), and minerals such as iron, calcium, magnesium, and zinc.
- **Gluten-free:** Ideal for individuals with gluten intolerance or celiac disease.
- **Low Glycemic Index:** Helps manage blood sugar levels, making them suitable for diabetics.
- **Digestive Health:** High fiber content aids digestion, prevents constipation, and promotes gut health.
- **Combating Malnutrition:** Finger millet is calcium-rich, pearl millet is iron-rich, and barnyard millet has high fiber—making them effective against micronutrient deficiencies.

2. Health Benefits

- **Reduces Risk of Chronic Diseases:** Regular consumption lowers risks of obesity, type 2 diabetes, and cardiovascular diseases.
- **Weight Management:** High satiety value helps in controlling hunger and maintaining healthy body weight.
- **Supports Bone and Immunity:** Calcium- and iron-rich millets strengthen bones and enhance immunity.

3. Environmental Benefits (Good for the Planet)

- **Climate-Resilient Crops:** Millets thrive in arid and semi-arid regions with minimal water and inputs.
- **Low Carbon Footprint:** Require less fertilizer and pesticide compared to rice and wheat.
- **Biodiversity Conservation:** Cultivation of diverse millet varieties promotes agrobiodiversity and ecological balance.

4. Economic and Social Benefits (Good for Farmers)

- **Resilient Livelihoods:** Provide food and fodder security for smallholder farmers in rainfed areas.
- **Low Input Cost:** Millets require fewer resources, reducing production risks and costs.
- **Value Addition & Market Potential:** Millet-based products (flakes, pasta, snacks, bakery items) create income opportunities and promote rural entrepreneurship.

Indian Scenario of Millets

India is the largest producer and consumer of millets in the world, contributing nearly 20 percent of global production and around 80 percent of Asia's production. Traditionally, millets formed the staple diet of millions across rural India, especially in semi-arid and rainfed regions. They were cultivated extensively before the Green Revolution; however, with the rise of rice and wheat under government procurement and subsidy systems, millet cultivation and consumption saw a steep decline. In recent years, however, millets have regained importance due to their nutritional value, climate resilience, and role in sustainable agriculture. Recognizing their potential, the Government of India has launched multiple initiatives such as the National Year of Millets (2018), inclusion of millets in the Public Distribution System (PDS), and most notably, the International Year of Millets 2023, spearheaded by India at the United Nations. These efforts aim to revive millet cultivation, diversify diets, and enhance food security. Major millet-growing states in India include Rajasthan, Maharashtra, Karnataka, Andhra Pradesh, Telangana, Madhya Pradesh, and Tamil Nadu. Among these, Rajasthan leads in pearl millet production, while Karnataka is a major producer of finger millet. Despite their high nutritional profile, millets are still largely considered as food for the poor or rural populations. However, with increasing urban health awareness, millet-based products are now entering modern retail chains, food processing industries, and even global markets. Millets are also being promoted under the “Nutri-cereals” initiative, highlighting their role in combating malnutrition, reducing dependency on water-intensive crops, and supporting smallholder farmers in rainfed regions. Today, India is positioning itself as a global hub for millets, with a vision to integrate them into both domestic diets and international food systems, thereby ensuring a sustainable future for agriculture and nutrition.

Value-Added Products of Millets

Millets, once consumed mainly as boiled grains or porridge, are now being processed into a wide range of value-added products that cater to both traditional and modern food preferences. This transformation not only enhances consumer acceptability but also generates higher market value and income opportunities for farmers and entrepreneurs.

1. Traditional Products

- **Flours:** Millet flour (Ragi, Bajra, Jowar) used for rotis, dosas, idlis, upma, porridges, and laddoos.
- **Beverages:** Traditional drinks like *Ragi malt*, fermented millet-based drinks, and health mixes.
- **Snacks:** Roasted millet grains, popped millets, and murukku.

2. Modern Processed Products

- **Bakery Products:** Biscuits, cookies, cakes, muffins, and bread prepared from millet flour.
- **Breakfast Cereals:** Millet flakes, muesli, granola, and instant mixes.
- **Ready-to-Eat/Ready-to-Cook Items:** Noodles, pasta, vermicelli, dosa mixes, instant porridge mixes, and soup mixes.
- **Snacks & Extruded Foods:** Millet-based chips, puffed snacks, energy bars, and extruded products like millet kuskur.

3. Nutraceutical and Health Products

- **Gluten-Free Foods:** For health-conscious and gluten-intolerant consumers.
- **Diabetic-Friendly Foods:** Low glycemic index millet mixes.
- **Protein & Energy Bars:** Millet-based health bars enriched with nuts and seeds.
- **Baby Foods & Health Mixes:** Nutritious ragi powders and weaning foods.

4. Industrial and Specialty Products

- **Fermented Products:** Millet beer, probiotic beverages.
- **Millet-Based Plant Milk:** Similar to oat or almond milk, millet milk is gaining traction.
- **Organic Millet Blends:** Packaged mixes marketed as superfoods.

New Initiatives in Millet-Based Products & Value Chains

1. **ITC Mission Millets-** ITC's Mission Millets promotes millets through product development, sustainable farming, and consumer awareness, offering both 100 percent millet products and millet-enhanced items across brands like Aashirvaad, Sunfeast, Bingo, Yippee, and Candyman.
2. **Nestlé India's Millet Product Innovations-** Nestlé India is expanding its millet portfolio with products like Masala Millet porridge, Maggi Oats Noodles with Millet Magic, and CEREGROW ragi cereals, offering high-fiber, low-calorie, and preservative-free healthier alternatives.

3. **PLI Scheme for Millet-Based Goods-** The Indian government promotes millet-based products through the PLI Scheme for RTC and RTE items, while the PMFME Scheme supports processing units, incubation centres, and marketing initiatives.

4. **Shree Anna & Infrastructure Upgrades During International Year of Millets (IYM)-** As part of the International Year of Millets (IYM-2023), India undertook several initiatives to strengthen processing and preservation infrastructure under the banner of **Shree Anna**, recognizing millet as an important food grain. In addition, efforts were made to identify districts under the **One District One Product (ODOP)** programme with a focus on millet-based items, alongside the establishment of incubation centres, and support for marketing and branding initiatives.

5. **Export Promotional Strategies-** The Indian government, via APEDA, promotes millet exports through trade expos, branding, and global positioning to boost market opportunities and establish millets as a recognized superfood worldwide.

6. **Startups & Private Brands-** Several Indian startups like Slurrp Farm, Millet Amma, and Phalada Pure & Sure are innovating millet-based products noodles, flakes, cereals, and snacks targeting urban consumers with healthy, convenient, and ethically sourced superfoods.

7. **State Level & Regional Initiatives-** In Uttarakhand "Millet Mission" aims to expand cultivation by 2030-31, while other states enhance processing, value chains, and infrastructure to strengthen the millet ecosystem.

Challenges Faced in Millets at Different Levels

1. **Production Level-** At production level the following challenges are there:

- **Declining Cultivation Area:** Millets were largely replaced by rice and wheat during the Green Revolution, leading to a decrease in acreage.
- **Low Yield:** Traditional cultivation methods, inadequate irrigation, and poor access to quality seeds result in lower productivity.
- **Climate Vulnerability:** While millets are drought-resistant, erratic rainfall and extreme weather events can still impact yields in some regions.

2. Processing Level- At processing level the following challenges are there:

- **Limited Infrastructure:** Insufficient modern milling, storage, and processing facilities affect quality and shelf life.
- **Value Addition Gap:** Lack of advanced processing technologies restricts production of ready-to-eat or ready-to-cook millet products.
- **High Cost of Processing:** Small-scale farmers and enterprises often face high costs for processing and packaging.

3. Marketing and Consumer Level- At marketing and consumer level the following challenges are there:

- **Low Consumer Awareness:** Many consumers still perceive millets as “coarse cereals” for poor populations rather than nutritious superfoods.
- **Limited Market Access:** Millet products are less visible in urban retail chains and e-commerce platforms compared to rice, wheat, and other cereals.
- **Pricing Challenges:** Processed millet products are often priced higher than conventional cereals, limiting wider adoption.

4. Policy & Institutional Level- At policy and institutional level the following challenges are there:

- **Fragmented Policy Support:** While recent initiatives exist, consistent long-term policies are needed for millet promotion.
- **Credit & Financial Barriers:** Smallholder farmers and micro-entrepreneurs face difficulties in accessing affordable loans for cultivation and processing.
- **Research & Development Gaps:** Limited investment in breeding high-yield, pest-resistant, and nutritious millet varieties.

Strategies to Overcome Challenges faced in Millets at different levels

1. **Production:** Develop high-yield, pest-resistant, and climate-resilient varieties; promote modern farming techniques; provide farmer training on best practices.
2. **Processing:** Establish modern milling and storage facilities; adopt technology for RTC and RTE products; encourage cooperatives and shared processing units to reduce costs.
3. **Marketing & Consumer Awareness:** Run campaigns promoting millets as superfoods; use attractive packaging; expand retail, e-commerce, and institutional channels.
4. **Policy & Institutional Support:** Strengthen millet promotion schemes; provide credit, subsidies, and incentives; invest in R&D; integrate millets into public distribution, school meals, and nutrition programs.

CONCLUSION

Millets, once seen as “coarse cereals,” are now recognized as nutrient-rich smart foods with potential for health, sustainability, and economic empowerment. Their climate resilience, low water needs, and high nutritional value help combat malnutrition, lifestyle diseases, and environmental challenges while supporting smallholder farmers. In India, initiatives like the International Year of Millets 2023, PLI and PMFME schemes, state missions, and APEDA export programs, along with efforts by ITC, Nestlé, and startups, are boosting millet production, processing, and market reach. Despite challenges in cultivation, infrastructure, consumer awareness, and policy support, integrated strategies in farming, processing, marketing, and policy can establish millets as a future superfood, promoting sustainable agriculture and improved nutrition.