

## Protected Millets in Tribal Areas

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### **Abstract**

*The primary objective of this research paper is to highlight the importance and utility of traditional minor millets found in tribal regions. Millets such as bajra (pearl millet), nagli (finger millet), kodri (kodo millet), sama (little millet), and then (foxtail millet) are rich in various nutrients and play a vital role in maintaining physical health. These grains are an integral part of the traditional agriculture and dietary practices of tribal communities. However, with the rise of modern agricultural methods and food systems, the consumption of these millets is declining. This research aspires to promote the conservation and revival of these grains. The paper studies the cultivation, usage, traditional food practices, and health benefits of these millets in tribal areas. Additionally, it emphasizes the significance of reviving millets for enhancing food security.*

**Keywords:** *Millets, Tribal Diet, Nutritional Security, Traditional Food.*

### **Introduction:**

This study focuses on the traditional millet-based diets rich in nutritional value that are preserved in tribal regions. Millets, also known as "Shridhanya" or "Laghu Dhanya" (minor grains), have traditionally been cultivated in the tribal areas of India. They are important not only for food security but also for nutritional security. This paper emphasizes the current status of millets in tribal regions, their significance, the need for their conservation, and the role of government schemes in promoting them. Millets, referred to as "Nutri-cereals" or "minor millets", are among the oldest crops grown in India. For tribal communities, millets have held great importance due to their nutritional value, climate resilience, and contribution to food security. In regions of Gujarat such as Dahod, Narmada, Chhota Udaipur, Dang, and Sabar kantha, millets like bajra (pearl millet), ragi (finger millet), and jowar (sorghum) have been cultivated for centuries. The term "protected millets" refers to efforts to preserve and promote these traditional grains through government schemes, awareness programs, and sustainable farming practices.

Since millets can yield good harvests even with low rainfall, minimal fertilizers, and poor soils, they are extremely important for ensuring livelihoods and health security in tribal areas. Therefore, conserving and promoting millets is essential not only for agricultural development but also for preserving tribal culture, improving nutrition, and supporting sustainable development.

#### Literature Review:

**Jyoti Chaudhary, Rohit Shelar, Kalpana Thakur, and Rajat in their 2023** study titled “Millets in India: Production, Consumption, and Impact on Food Security,” Singh focused on the area, production, and productivity of jowar, bajra, ragi, and small millets. The major producing states are Uttarakhand (small millets), Maharashtra (jowar), Rajasthan (bajra), and Karnataka (ragi). Their analysis showed that the increase in ragi and bajra production was due to higher yield, while for jowar and small millets, it was due to expanded cultivation area. However, millet consumption has declined in both rural and urban areas over the years. The authors suggested raising awareness about the health benefits of millets through training programs, workshops, and campaigns. They also recommended that the government provide incentives and subsidies to promote small millet cultivation.

**Kondala Lokesh, Chetan R. Dudhagara, Ashish B. Mahera, Sathish Kumar, and H.D. Patel in their 2022** study “Millets: The Future Smart Food,” highlighted that 86% of Indian farmers are small and marginal, facing financial instability. Indian women and children are suffering from malnutrition and hidden hunger. Climate change is expected to negatively impact global agriculture in the coming decades, making millets an essential “smart food” solution. Despite these efforts, demand for millets and their value-added products remains low. The authors suggest increasing awareness through campaigns, conducting consumer surveys to understand perceptions, including millets in the Public Distribution System (PDS), and expanding millet-based meals in schools to tackle hidden hunger. They also recommend supporting millet-based startups with incentives and subsidies.

**S.S. Deshpande, D. Mohapatra, M.K. Tripathi, and R.H. Sadvatha in their 2015** study “Kodo Millet – Nutritional Value and Utilization in Indian Foods,” highlighted that Kodo millet, one of the ancient grains originating from Africa, was introduced in India thousands of years ago. It is a drought-resistant crop grown in the dry and semi-dry regions of African and Asian countries. In India, Kodo millet is mainly cultivated in the Deccan region and extends up to the foothills of the Himalayas.

**M.V. Rao in his 1989** study “The Small Millets: Their Importance, Present Status and Outlook,” M.V. Rao discussed the global significance and origins of small millets. Some researchers believe these grains evolved from wild grasses due to continuous harvesting for food, while others suggest that the spread of agricultural practices was necessary before domestication began.

He noted that some indigenous communities, like the Alyawarra people of central Australia, never domesticated crops, although they used wild grasses morphologically similar to cultivated ones as an important part of their traditional diet. Small millets are primarily grown in tropical and subtropical regions of the Old World. This group includes finger millet (*Eleusine coracana*), proso millet (*Panicum meliaceous*), foxtail millet (*Setaria italica*), little millet (*Panicum sumatrense*), barnyard millet (*Echinochloa colona*), kodo millet (*Paspalum scrobiculatum*), teff (*Eragrostis tef*), and fonio (*Digitaria exilis* and *D. iburua*).

**P.S.J. Michaelraj and A. Shanmugam, in their 2013** study titled “*A Study on Millets-Based Cultivation and Consumption in India*,” stated that “millets are among the oldest known foods to humankind and perhaps the first grain used for domestic purposes.” Millets are small-seeded grasses that are hardy and grow well in dry regions as rain-fed crops, even under marginal soil fertility and moisture conditions. They are also unique due to their short growing season — maturing from seed to harvest in about 65 days — which is particularly important in densely populated regions. When stored properly, whole millets can last for two years or more. Although they hold a relatively low rank among food crops in Indian agriculture, they are critically important for regional and agricultural-level food security. Small millets can grow in poor soils and adverse climatic conditions. Due to their short growing season, they fit well into multiple cropping systems in both irrigated and dryland farming.

**Mehanathan Muthamilarasan and Manoj Prasad, in their 2021** study titled “Small Millets for Enduring Food Security Amidst Pandemics,” stated that food security remains a persistent issue, and current staple crops are not sufficient to address challenges like the ongoing COVID-19 pandemic. They propose that small millets have the potential to become new staple crops, especially in hunger-prone regions. However, millet cultivation currently faces limitations due to lack of intensification, minimal use of genetic tools for crop improvement, and the need for optimized storage and supply chains.

**Rachit Saxena, Sai Kranthi Vanga, Jin Wang, Valérie Orsat, and Vijaya Raghavan, in their 2018** review titled “Millets for Food Security in the Context of Climate Change: A Review,” stated that a growing population leads to a continuous rise in food demand. This global concern has created pressure on resources such as water and soil. Climate change directly impacts the quality and availability of these resources, which adversely affects our food systems and crop productivity — especially major cereals like rice, wheat, and maize. In this review, the authors analyzed the availability of water and soil resources using various modelling scenarios across different regions of the world. Most models predict a decline in production rates of various cereal crops in the future.

### **Historical Significance of Millets:**

1. Part of Ancient Diet: Millets are among the earliest grains cultivated by humankind. For thousands of years, they have been a staple food for tribal and rural communities.
2. Connection with Indian Culture: References to millets can be found even in the Vedic period. In Ayurveda, millets are considered as “superior nutritious grains.”

3.Usage in Tribal Communities: Especially in regions like Dahod, Chhota Udaipur, Narmada, Dang, and Sabar kantha, traditional agriculture and diets have long relied on millets. Millet-based dishes are also used during festivals and religious rituals.

4.Nutritional and Health Benefits: Millets are rich in protein, fibre, iron, and calcium. Historically, they have served as a major source of nutrition in rural and tribal communities.

**Use of Millets in Tribal Areas:**

1.As a Staple Food: Millets like bajra (pearl millet), ragi (finger millet), jowar (sorghum), and nagli are used daily in the form of rotis, khichdi, lapsi, bhakri, and more.

2.For Nutrition: Rich in protein, calcium, iron, and fiber, millets help meet the nutritional needs of tribal communities.

3.During Festivals and Religious Rituals: During fairs, festivals, and religious ceremonies, many delicious dishes are specially prepared using millets.

4.For Animal Fodder: Millet husk and by-products are used as cattle feed.

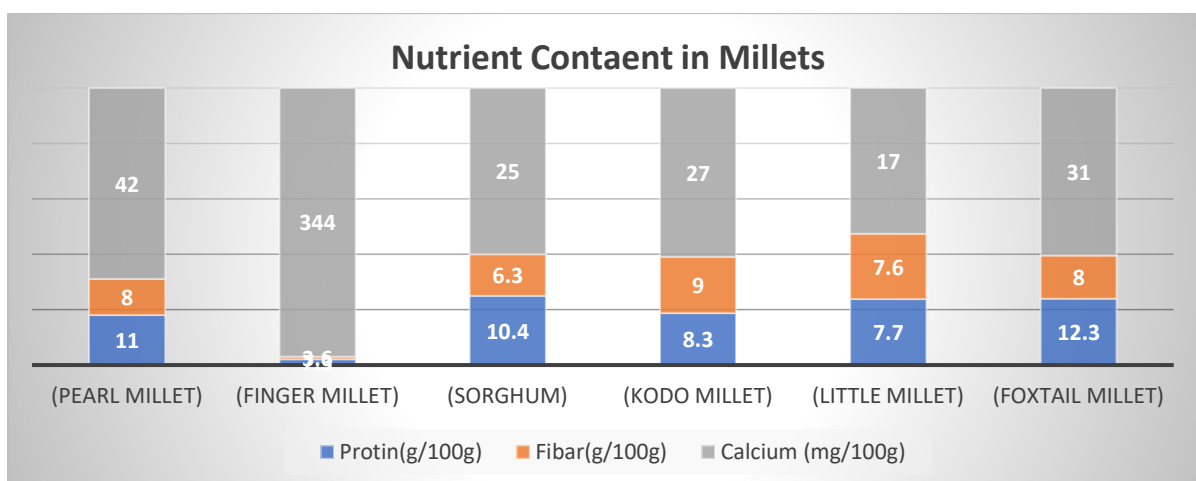
5.Economic Support: Selling millets in local markets provides income to tribal families.

6.For Health: Millet-based diets offer natural protection against diabetes, heart disease, and malnutrition.

7.Importance in Sustainable Agriculture: As they require less water, millets are well-suited for sustainable farming in tribal regions.

**Millet Varieties and Their Nutritional Value:**

Millet Varieties and Their Nutritional Value				
types of Millets	Protin (g/100g)	Fiber (g/100g)	Calcium (mg/100g)	Major Benefits
(Pearl Millet)	11	8	42	Controls diabetes, rich in iron
(Finger Millet)	7.3	3.6	344	Strengthens bones, excellent for children and women
(Sorghum)	10.4	6.3	25	Gluten-free, beneficial for the heart
(Kodo Millet)	8.3	9	27	Excellent for digestion, protects against malnutrition
(Little Millet)	7.7	7.6	17	A great alternative to rice, ideal for diabetes
(Foxtail Millet)	12.3	8	31	Helps reduce cholesterol



### Traditional Millet Recipes:

1. Bajra Bhakri: A flatbread made from pearl millet (bajra) flour, Bhakri is a staple part of the tribal diet.
2. Ragi Lapsi / Malido: A sweet porridge or dessert made from finger millet (ragi) flour, rich in nutrients and traditionally consumed for its health benefits.
3. Jowar Roti: A flatbread made from sorghum (jowar) flour, usually eaten with hot milk, buttermilk, or vegetable curry.
4. Kodo Millet Khichdi: Kodo millet is cooked with lentils and vegetables to make a nutritious khichdi (savory porridge).
5. Sama Upma: Little millet (sama) is used similarly to rice and is often made into upma, a savory breakfast dish.
6. Foxtail Millet Porridge (Kangani no Daliya): Foxtail millet (kangani) is boiled and eaten as daliya (porridge) or khichdi.

### Challenges for Millets in the Modern Era:

1. Changing Food Preferences: In today's times, people prefer rice and wheat more, leading to a gradual decline in millet consumption.
2. Lack of Market and Demand: There is an inadequate market infrastructure for millets, which results in farmers not receiving fair prices for their produce.
3. Lack of Government Support: Subsidies and support are higher for rice and wheat, while millets receive less attention. Additionally, millets are given limited space in the Public Distribution System (PDS).

4. Lack of Processing and Storage Facilities: Due to lack of modern technology for processing and storing millets, they are prone to spoilage. Traditional methods are not sustainable in the long term.
5. Lack of Awareness: There is limited public knowledge about the nutritional value of millets, especially in urban areas, where their importance is often overlooked.
6. Impact of Climate Change: Irregular rainfall patterns and extreme weather conditions like droughts and heatwaves negatively impact millet cultivation and pose challenges for farmers.
7. Lack of Interest Among Youth: Many young people are more inclined towards other employment opportunities than traditional farming. There is also less enthusiasm for millets among the younger generation.

#### **Future Directions for Millets:**

1. Increase in Government Support: Include millets in the Public Distribution System (PDS) to ensure wider accessibility.
2. Awareness Campaigns: Promote the nutritional value of millets through campaigns in both rural and urban areas.
3. Market and Processing Infrastructure: Develop facilities so that farmers receive fair prices and value-added products like biscuits, flakes, and ready-to-eat foods can be produced.
4. Research and Development (R&D): Develop high-yielding millet varieties and promote modern farming techniques for better productivity.
5. Engaging Youth in Agriculture: Encourage the younger generation to take interest in millet farming and related agribusiness.
6. Global Market Promotion: Promote “Indian Millets” as a global brand to increase demand in the international market.

#### **Importance of Millets for Sustainable Food Systems:**

1. Grows with Less Water: Compared to rice and wheat, millets require significantly less water. They can grow easily in rain-fed farming systems.
2. Climate-Resilient Crop: Millets can thrive in drought, heat, and low-fertility soils, making them a secure option for farmers in the face of climate change.
3. Nutrient-Rich: Rich in protein, calcium, iron, fiber, and vitamins, millets help reduce malnutrition and health-related issues.
4. Environment-Friendly Crop: Requires minimal chemical fertilizers and pesticides, helping to maintain soil fertility and promoting sustainable agriculture.

5. Economic Benefits: For tribal and small-scale farmers, millets offer good income at low cost. They open up new opportunities from local markets to exports.

5. Part of Traditional Diet and Culture: In tribal areas, millets are preserved as part of traditional food systems and represent a sustainable food lifestyle rooted in culture.

### Conclusion:

Millets hold deep historical, cultural, and nutritional significance in tribal life, serving as staple foods and sustainable crops. Despite modern challenges reducing their use, their health benefits and resilience remain vital. Reviving millet cultivation, improving awareness, and strengthening support systems can ensure food security, environmental sustainability, and preservation of indigenous traditions for future generations.

### References

1. Chaudhary, J., Shelar, R., Thakur, K., & Singh, R. (2023). Millets in India: Production, consumption and impact on food security. *Asian Journal of Agricultural Extension, Economics & Sociology*, 41(8), 151–162.
2. Lokesh, K., Dudhagara, C. R., Mahera, A. B., Kumar, S., & Patel, H. D. (2022). Millets: The future smart food. *The Pharma Innovation Journal*, 11(4), 75–84.
3. Deshpande, S. S., Mohapatra, D., Tripathi, M. K., & Sadvatha, R. H. (2015). Kodo millet: Nutritional value and utilization in Indian foods. *Journal of Grain Processing and Storage*, 2(2), 16–23.
4. Hariprasanna, K. (2023). Small millets in India: Current scenario and way forward. *Indian Farming*, 73(1), 38–41.
5. Michaelraj, P. S. J., & Shanmugam, A. (2013). A study on millets based cultivation and consumption in India. *International Journal of Marketing, Financial Services & Management Research*, 2(4), 49–58.
6. Muthamilarasan, M., & Prasad, M. (2021). Small millets for enduring food security amidst pandemics. *Trends in Plant Science*, 26(1), 33–40.
7. Saxena, R., Vanga, S. K., Wang, J., Orsat, V., & Raghavan, V. (2018). Millets for food security in the context of climate change: A review. *Sustainability*, 10(7), 2228.