

Millet's Role in Sustainable Agriculture

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ABSTRACT

Sustainable agriculture has become a global imperative, aiming to strike a balance between food production, environmental conservation, and socio-economic well-being. This article examines the multifaceted role of millet in sustainable agriculture, highlighting its potential to address these complex challenges. Millet, often considered a "forgotten crop," offers a unique set of attributes that contribute to sustainable farming practices.

INTRODUCTION

Millets are ancient, climate-resilient grains that offer a sustainable solution to the present challenges of climate change, food insecurity, soil degradation, and water scarcity (Kumari *et al.*, 2024). Unlike high-input cereals such as rice and wheat, millets require less water, fewer fertilizers, and minimum pesticides, making them highly suitable for rainfed and resource-poor regions (Rathore *et al.*, 2019). Their ability to thrive in drought-prone and degraded soils enhances agricultural sustainability while reducing dependence on groundwater and chemical inputs. Additionally, their deep-

rooted nature improves soil structure, prevents erosion and enhances carbon sequestration, making them an integral component of climate-smart agriculture (Kumar *et al.*, 2022).

Beyond their environmental benefits, millets are highly nutritious, providing essential proteins, fiber, amino acids, vitamins, and minerals such as iron, calcium, and phosphorus. Their low glycemic index makes them beneficial for diabetes management, while their high dietary fiber content supports digestive health and metabolic balance. Incorporating millets into daily diets can

significantly improve public health, especially in regions facing nutritional deficiencies (Tripathi *et al.*, 2023).

Millets in Sustainable Agriculture:

- 1. Drought and Climate Resilience:** Millets have deep root systems that enable them to absorb moisture efficiently from the soil, allowing them to withstand water-stressed conditions. This resilience makes them a sustainable choice for farmers worldwide.
- 2. Crop Rotation and Diversification:** Millets are well-suited for crop rotation and diversification strategies. Rotating millets with other crops helps break pest and disease cycles, improves soil fertility, and reduces weed pressure. Diverse cropping systems with millets contribute to ecosystem resilience and enhance overall farm productivity.
- 3. Water Use Efficiency:** Millets are known for their efficient water use, requiring less water compared to other staple crops like rice and wheat.
- 4. Soil Health Improvement:** Millets have deep root systems that help break up compacted soils and improve soil structure. Their drought tolerance and low input requirements reduce soil erosion and nutrient runoff, promoting soil health and fertility.
- 5. Economic and Social Aspects:** Millets have the potential to play a main role in rural poverty alleviation and improving the economic and social well-being of farmers. They offer income security and diversified income sources, such as millet flour and many varieties of snacks, creating a market, thereby increasing the farmers' income.
- 6. Nutritional Security:** Millets are highly nutritious, rich in protein, fiber, vitamins, and minerals. Integrating millets into diets

can improve nutritional security and contribute to combating malnutrition and diet-related health problems, particularly in vulnerable populations.

- 7. Smallholder Livelihoods:** Millet cultivation offers economic opportunities for smallholder farmers, especially in marginal and rainfed areas where other crops may not thrive.

Challenges in promoting millets in Sustainable Agriculture:

While millets offer numerous advantages in sustainable agriculture, there are also several challenges and constraints that must be addressed to fully harness their potential.

- 1. Low Yields:** One of the primary challenges of millet cultivation is their comparatively lower yields when compared to major cereal crops like rice, wheat, and maize. Millets have smaller grains and typically produce less biomass.
- 2. Traditional Crop Image:** In some regions, millets are associated with traditional, subsistence farming and are considered as "poor people's food." This perception can deter farmers from considering millets as a viable crop choice.
- 3. Market Barriers:** The limited market demand and access for millet-based products can hinder their adoption by farmers.
- 4. Limited Research and Development:** Compared to major cereal crops, millets have received less attention in terms of research and development. This has hindered the advancement of millet agriculture.
- 5. Policy and Regulatory Issues:** Government policies, subsidies, and regulations can significantly impact the

cultivation and promotion of millets. In some cases, policies may favor other cereal crops, making it difficult for millets to compete.

- 6. Lack of Awareness:** Many farmers, particularly in urbanizing regions, lack awareness of the benefits of millet cultivation.

CONCLUSION

Millets have a better scope in sustainable agriculture due to their drought and climate resilience, promotion of agrobiodiversity, less crop investment, and eco-friendly practices. Hence, they may be selected as a better alternative to widely consumed staple grains like rice and wheat. Millets provide better nutrients to economically weaker sections in Africa and Asia. Their role in drought resilience, biodiversity conservation, and promotion of the growth of prebiotics, nutritional richness, and health make them invaluable assets in promoting sustainable agriculture. The promotion of millet cultivation can revitalize rural communities by preserving traditional farming practices, conserving agrobiodiversity, increasing the livelihood of rural farmers, and improving self-sufficiency. Governments should encourage millet cultivation by offering

subsidies, crop insurance, millet and allied processing units to the farmers and supply the millets to the people below the poverty line through the Public Distribution System (PDS).

REFERENCES

- Kumar H., Thakur A.K., Pradhan A., Sharma G.K. and Singh D.P. 2022. Evaluation of millet based intercropping system under rainfed upland situation. *International Journal of Current Microbiology and Applied Sciences* 11: 412-417
- Kumari N., Kumari M. and Kusum A. 2024. Millets: Background, need and importance in climate resilient cropping systems. Pp 1-10 (<https://www.kdpublications.in>)
- Rathore V.S., Tanwar S.P. and Yadav O.P. 2019. Integrated farming system: Key to sustainability in arid and semi-arid regions. *The Indian Journal of Agricultural Sciences* 89: 181-192
- Tripathi G., Jitendrakumar P.H., Borah A., Nath D., Das H., Bansal S. and Singh B.V. 2023. A review on nutritional and health benefits of millets. *International Journal of Plant & Soil Science* 35: 1736-1743.