

RESEARCH ARTICLE

Millet's cultivation in India: Challenges and Opportunities towards achieving sustainable farming and inclusive development

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ABSTRACT

Millets are cultivated in resource poor areas of our nation by small and marginal farmers. Being climate resilient, improving their production and productivity through the use of improved high-yielding varieties is the source to address many of the malnourishment issues faced by our women, children, and low-income groups. The establishment of Millets Park, the creation of a new millet movement empowering primitive, vulnerable tribal groups, and ensuring gender diversity are challenges and opportunities to be explored towards achieving sustainable farming and inclusive development.

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INTRODUCTION

Millets remain a powerhouse of proteins is cultivated mostly following the traditional methods of cultivation in rural areas, it needs very significantly less fertilizer application and offers more health benefits to our increasing population; it also offers more scope towards health benefits to our increasing population; it offers more scope for value addition or creating more employment opportunities for the rural and urban youth of our nation. Increased targeted marketing of value-added millets among the needed population based on their segmentation is sure to bring about the socio economic transformation in rural areas. With at present higher minimum support prices offered to millets than major crops like rice or wheat, increase in production and productivity of our millets are sure to fetch more remunerative returns to the millets cultivating small and marginal farmers. However, more needs to be done to promote millet cultivation in our nation, taking into account based on our development needs and priorities in the short and long term.

Millet's production and productivity issues:

The present cultivation of millets in our nation is by mostly using local and traditional millets varieties, which gives very less yields to the millets cultivating farmers. So, the need of the hour is replacing these traditional varieties with high-yielding millet varieties, which fetches higher production and productivity to the millets cultivating farmers. The rise in the area under cultivation of millets is seen on an increasing trend from 12.29 million hectares to 15.48 million hectares from 2013-2014 to 2021-2022. The need of the hour is to create more millets clusters to effectively disseminate recommended package of practices on millets cultivation to the millets cultivating farmers through the available public and private extension networks and institutional mechanism in traditional millets cultivating areas and in the non-traditional millets cultivating areas of our resource-poor along with the promotion of organic millets cultivation in our nation, is sure to protect the biodiversity in millets cultivation,

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which will also bring about more income benefits to the millets-cultivating resource-poor farmers of our nation. The inclusion of millets in our public distribution systems (PDS) will also further create more demand in our millets production and supply chains and assist us in improving the production and productivity of millets in the near future. These initiatives are sure to solve many of the health-related issues of low- and middle-income groups dependent on our PDS. With the duty of our state to raise the well-being of its citizens through increased nutrition and health as by Article 14 of the constitution. The need of the hour is to further integrate more millets cultivation in all our farming systems as our 70 percent farmlands are favorable for millets cultivation (both Irrigated and rainfed) in our nation. Millets can also be used as famine reserves. As they are drought tolerant in nature, they reduce and low carbon footprint, they reduce malnutrition in all forms and also the present-day impact of climate change issues in our farming.

Millets are as important nutri cereals to raise our health and nutritional status

The replacement of millet as an important nutri cereal replacing the present maida is gaining momentum across our nation due to its comparative health and nutritive benefits. Being a demand-driven product fetching more price in our markets today, this has resulted in reintroducing demand-driven product that fetches more price in our markets today, this has resulted in the reintroduction of millets in many of our farming ecosystems, fetching more economic returns to our farming communities. The successful blending of millets in britania biscuits and its sales in our markets and abroad remains a prominent success story that needs to be created to further in the best interests of all stakeholders involved in millets cultivation shortly. On the other hand, more farm research also needs to be done to create biofortified millets rich in minerals and vitamins (Micro nutrients) to meet the daily dietary needs of millet consumers belonging to various crucial our population. The present HANSA (Health and Nutrition for school-going children) programs with millets as an important dietary component in solving many of the malnutrition-related health problems among the low-income group children studying in our schools. This also needs to be further extended to more geographies among our other disadvantaged category population of our society like the low-income group women, destitutes, orphans, transgenders to solve their malnutrition issues. The use of millets

in the diets for our obesity population is also sure to solve many of their health-related issues. Over a period of time, these development initiatives also have the potential to improve our human resource and health ranking and assist in the creation of a healthy human resource capable of meeting the development needs of our nation in a short span of time. So, the inclusion of more millets in our social security and safety programs is also sure to assist us in reaping the benefits of our demographic dividend and also widen our social security net shortly.

Millets parks: The novel extension way ahead for doubling farmers' income

Millet awareness campaigns are done at periodical and stipulated intervals of time by various development departments and institutions across our nation and needs established millets parks at all districts of our nation to showcase successful case studies, success stories, recommended technologies on millet cultivation advocated by state and central governments, indigenous technologies on millets cultivation, germplasm collections on millets cultivation, value-added and processed products on millets for the benefit of all stakeholders involved in millets production and processing. This will provide impetus to our present-day millet cultivation, as well as value addition and marketing exercises across our nation. Innovations on millets cultivation, more startups initiatives on millets, successful millets farmer producer organizations like Raithu Bandhu Samithi, an exclusive FPO for millets, Odisha millets mission initiatives also need to be showcased in our kisan melas organized by Central Agricultural Research Institutions, State Agricultural Universities to improve our present-day extension approaches in reaching out to a large quantum of diversified farmers of our nation. Our millet cultivation being very efficient on economic water productivity, climate resilient in nature, grows under stress conditions, needs very less investments in its cultivation, resistant to pest and diseases, rich in dietary fibre and nutrition and plays an important role in controlling many health-related ailments like anaemia, constipation, diabetics, diarrhoea, cancer and also many non-communicable diseases. So, the need of the hour is to diversify our food consumption basket with millets replacing the traditional cereals consumption in our nation. Various research studies have reported that our Indians are

consuming dangerous levels of cereals, which has less fibre content. But rich households in our nation have diversified their food basket with more millets, animal protein and organic farm produce in our nation.

Millet movement: A new development need

Our nation today is in dire need of a millet's movement at the national level for the removal of its supply chains constraints and improving the production and productivity of millets at all levels. Formation of more millet clusters across the length and breadth of our nation, inclusion of millets in our PDS, social security programmes, offering financial incentives for its cultivation, value addition and marketing, providing market access, support and infrastructural facilities, improved and transparent mechanism for millets procurement by government agencies and development departments, establishing a new and proper standards for millet commercialisation for further scaling up its sales are the new areas that needs our immediate focus and attention. More public and private investments in the creation of infrastructure facilities for millets processing, value addition, storage, logistics and ware housing and further more emphasis on millets research and development is sure to create a new revolution in the production, marketing and consumption of millets within our nation and abroad. Further, exploring the power of social media in reaching out to the unreached in our population and utilising the present E commerce platforms to effectively market millets under established brand names is sure to offer more economic dividends to all stakeholders in millets production and trade. The present small and marginal farmers, women farmers, tribals, farm labourers involved in millets production for the past many generations also needs to be recognised in this development process by identifying, documenting and nurturing their traditional indigenous knowledge on millets cultivation, processing and value addition. The herbal and medicinal properties of millet also need to be explored for increasing their commercial value in our domestic and international markets. Community patents, getting Geographic indication for millets and creating more blended products with millets for our FMCG markets are also sure to revolutionize the millets production and sales in our nation.

Empowerment of Primitive Vulnerable Tribal Groups (PVTs) through Millet cultivation

Union Ministry of Tribal Affairs through its Pradhan Mantri Janjati Adivasi Nyaya Maha Abhiyan (PM –

JANMAN), is taking up many development initiatives to empower isolated communities like our primitive vulnerable tribal groups to gain access to their rightful entitlements by overcoming their socio-economic challenges like remoteness, poor connectivity, lack of awareness about various government schemes and development programmes. A comprehensive mission involving many development departments aimed at improving their socio-economic conditions is presently undertaken. Being less literate and still using primitive agricultural technologies in their cultivation practices, they need to be trained on millets cultivation using improved scientific methods of cultivation. They can be also be made involved in the organic cultivation of millets suited to the needs of our domestic and international markets. In 2022- 2023 millets exports was to the tune of about 169,049 tonnes worth \$ 75,35 Millions. India has so far exported about 95 373 tonnes of millets worth 45.46 million during April – Month of this current fiscal 2023 - 2024. So, more involvement of PVTs in millets cultivation using their available resources and value adding them for marketing across geographies will bring about more economic remuneration to our disadvantaged tribal communities and be a part of millets value chain. Moreover, facilitating the starting of more Farmer producer organizations (FPOs) among the PVTs and the creation of more marketing and export-oriented startups involving their women and unemployed youth through development institutions like APEDA is sure to bring about socio-economic transformation among the primitive tribal communities in the near future.

Ensuring Gender diversity and empowering women farmers involved in millets cultivation

The millets cultivation involves the participation of women in large numbers. From land preparation to sowing, and carrying out all the intercultural farm operations, protecting the crops from birds and animals, they do a lot of manual jobs, which are very significantly less economically rewarding. Though they are involved in producing various millet crops, their consumption is significantly less and their marketable surplus is also very less. Usually, after meeting their family's needs the excess production goes to the farm markets for sales in all farm produce but as far as millets they sold in the markets to get their farm income for meeting their livelihood needs as their production and productivity is also low to the nearby

middle men and commission agents involved in farm trade. The absence of public procurement agencies at the grassroot level also results in this distress sales across geographies. This happens in mostly rainfed, dry land, and forest regions among the resource-poor farmers. The plight of the women millet farmers is even higher as their physical movement is restricted mostly due to many cultural restrictions in place in many disadvantaged villages of our nation. So, women involved in millets cultivation for many decades also suffer from malnutrition issues due to their many socio-economic constraints plaguing them. The present statistical figures across the world also brings to light that about 3 billion people primarily among the middle- and low-income groups do not get enough micro nutrients in their daily diets. Only 100 million people in farm families are eating nutrient-enriched foods. So, more needs to be done to improve the present production and productivity of our millets by increasing their production and productivity through popularising our present high-yielding millet varieties among the millet-cultivating farmers of our nation. Moreover, expanding the area under millet cultivation across our nation offers more scope for solving many of our present-day problems faced by our nation and the world. With 70 percent of our lands in our nation favourable for millets cultivation (both rainfed and irrigated), increasing the area under millets cultivation will assist us in solving many our malnutrition problems faced by our marginalised sections of the society and the low-income groups of the world dependent on our millet's exports. Being climate resilient in nature offers more scope for its cultivation in the near future taking into account our development needs and priorities. The present two crore lakshpathi scheme involving the women self-help group members of our nation needs to be expanded to the millets cultivating women farmers. Tribal women involved in millets cultivation and value addition breaking our present-day barriers faced by millets women cultivators bring about more inclusive development, assist us in achieving gender diversity in millets production and also bring about sustainable farm development involving all sections of our society in the near future. The successful millets sisters model of Andra Pradesh towards sustainable millets production also needs to be extended to other states and geographies where millets processing facility to manufacture ready to eat and ready to cook products are made involving the women FPO movement so that a new farming culture is created towards millets

cultivation in our nation in the best interests of our nation towards achieving sustainable farming and inclusive development in our nation in the near future. Our policy planners, farm scientists, extension professionals need to integrate and work together to devise appropriate farm strategies and mechanisms to make this socio-economic transformation happen in our nation.

CONCLUSION

Millets, being regarded as the power house of proteins is cultivated employing traditional methods in rural areas of our nation. The present cultivation of millets using the local and traditional varieties needs to be replaced with new high yielding varieties for increasing its production and productivity. Moreover, inclusion under public distribution systems with the establishment of more millet parks is sure to assist in doubling the farm income of millet farmers in short and long terms. Further, making of a millet movement and empowering of primitive vulnerable tribal farmer groups by involving them to be part of millet movement is sure to assist us in ensuring greater gender diversity there by also assisting us in empowering our women farmers involved in millets cultivation across our nation. Our Policy Planners, Farm scientists, Development workers, Extension professionals need to work together and devise appropriate farm strategies and extension mechanisms to make this socio-economic transformation happen in our nation.

REFERENCES

- Devi PB, Vijayabharathi R, Sathyabama S, Malleshi NG, Priyadarisini VB (2011) Health benefits of finger millet (*Eleusine coracana* L.) polyphenols and dietary fibre: a review. *J Food Sci Technol*. <https://doi.org/10.1007/s13197-011-0584-9>
- Ogbeba, J. (2019). Phytochemical and antibacterial property of finger millet (*Eleusine coracana*) on some selected clinical bacteria. *Access Microbiology* 1:135 <https://doi.org/10.1099/acmi.ac2019.po0037>
- Serba DD, Yadav RS, Varshney RK, Gupta SK, Mahalingam G, Srivastava RK et al (2020) Genomic designing of pearl millet: a resilient crop for arid and semi-arid environments. In: Kole C (ed) *Genomic designing of climate-smart cereal crops*. Springer, Cham, pp 221–286. https://doi.org/10.1007/978-3-319-93381-8_6

Yadav OP, Gupta SK, Govindaraj M, Sharma R, Varshney Rajeev K, Srivastava Rakesh K, Rathore A, Mahala RS (2021) Genetic gains in pearl millet in India: insights into historic breeding strategies and future perspective. *Front Plant Sci.* <https://doi.org/10.3389/fpls.2021.645038>

Harish M.S, Axay Bhuker, Bhagirath Singh Chauhan (2024) Millet production, challenges, and opportunities in the Asia-pacific region: a comprehensive review. Sec. *Crop Biology and Sustainability* Volume 8 – 2024. <https://doi.org/10.3389/fsufs.2024.1386469>