

Role of Millets in Global Value Chain

Surbhi Sinha¹, Dr. Parijat Saurabh²

¹Research Scholar, Department of Economic, Mahatma Gandhi Kashi Vidyapith, Varanasi, U.P.

²Supervisor, Department of Economic, Mahatma Gandhi Kashi Vidyapith, Varanasi, U.P.

ABSTRACT

Indian Agriculture plays a crucial role in the global value chains. It contributes significantly to food security and acts as a major exporter (contributing around 50 billion dollars), as per the reports of ICAR 2022. According to the reports of millets in Indian Institute of Millets Research (ICAR 2022), millets play a crucial role in global value chain, acting as a sustainable nutrient dense as a nutri-cereals. They enhance food security through climate-resilient production, require low water as per input required, provide high-value enriched with gluten free and processed products. They play a very important role in raising and empowering the small holder farmers which thereby provides low carbon foot print in alternative to rice and wheat.

The aim of the paper is basically to highlight the role of millets as a prominent part in global value chains. The sources which include reports of Indian Institute of Millets Research by ICAR 2022, Millets Reports by ICAR 2023, Millets for food and Nutritional Security in the context of climate Resilient Agriculture: A Review by International Journal of Plants and Soil Science(2022). The methodology so employed is based on secondary data sources like academic reports, journals, articles, research papers. Thus, it is been concluded that the role of millets helped in transforming the Indian agriculture from subsistence to commercial farming. This indicated a substantial growth opportunities through processing, marketing and global chains.

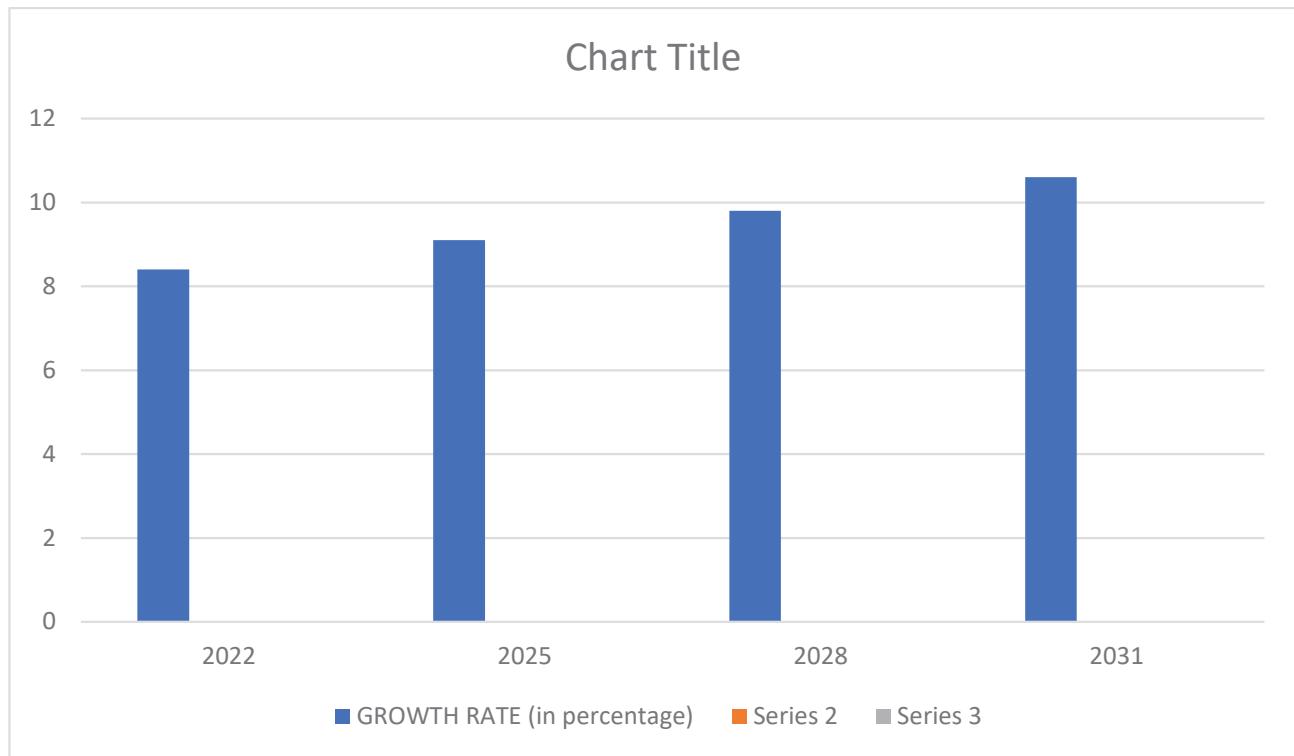
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Introduction

Millets a small-sized cereals cultivated for more than 100 centuries are highly-valued and are known for their nutritional as well as therapeutic values. Millets are divided broadly into major categories – a) major millets which include pearl millet which is cultivated worldwide; b) minor millets which include finger, proso, foxtail, kodo, browntop, little millets which are grown on a relatively smaller scale. They provide food as well as nutritional security to the people living in semi-arid regions because of adaptation to wide range of agroclimatic conditions and dryland ecosystem. These are grown both by small and marginal farmers. As per the reports of ICAR in 2023, they have global access to around 131 countries, India covers around 83% of Asia's millets cropping area, contributing around 41% of total millets production.

By global value chain, it basically mean the international dispersion of production, where intermediate inputs, services and raw materials cross border multiple times before reaching the final consumers.

Global Millets Market



Sources-FAO , showing average forecast of growth rate in millets up till 2031 .

As per FAO, the market will grow at the CAGR of 2.8% and the forecasted market size for 2032 in USA is \$10.9 billions. Since the green revolution their demand have shrunked down so in order to raise their demand and make its access globally , several of value chain approaches have been implemented which are as follows- *backward integration , nutritional evaluation , diversification of processing technologies , improvement of shell life , entrepreneurship development , promotional campaigning , commercialization , incubation and policy sensitization .*

Government of India in order to raise the awareness regarding the importance of millets have declared **2018 as the 'India's National Year of Millets'**; also **United Nations' International Year of Millets in 2023**

Statement of Research Problem-

Although millets have high nutritional value, considered as superfood or as nutria-dense their global cultivation area have declined steadily and the reason behind is the predominance of major cereals that is wheat, rice all majorly due to green revolution which have limited the expansion of millets production even though it is exceptionally much rich in nutrition when compared to above both.

Still government policies are playing a major role to promote millets production and trade. For instance – India's National Food Security Mission (2007) , supported millet farmers with financial aid , better seeds, cultivation practices ; Ministry of Agriculture and Farmers Welfare (2024) , offered minimum support prices for millets , ensuring fair returns for farmers. Likewise in order to raise their nutritional significance, India in United Nations' declared 2023 as International Year of Millets . In addition to Food and Agricultural Organization promotes climate resilient crops like millets through climate-smart agriculture enhanced the productivity , resilience to climate change and lowering greenhouse gas emissions .All these efforts have raised the market estimate of millets to around 12.06 billion in 2025 as per the reports of ICAR in 2025.

Still millets market faces the following challenges globally – lack of general consumer awareness

- Limited market access
- Supply inefficiencies

Literature Review

- ICAR published a paper *,Production and Technological gaps in Middle Indo-gangetic Plains (2014)*, aims to focus on how to overcome the obstacles regarding low productivity and profitability and analyze the production and technological gaps in the country and the method so employed was the survey and questionnaires on the eighty participants of Bihar and Eastern UP and the conclusion so revealed was that there is need to ensure timely availability of assured quality agricultural inputs and to develop marketing intelligence system and procurement of farmers produce on MSP.
- Department of Food and Nutrition (Punjab Agricultural University) published a paper, *Minor Millets: Abandoned grains with promising prospects (2022)*, focused on how to develop and popularize millets-based food products that provide poor people with convenience, flavor, texture, colour and shelf-stability at a low cost and the methodology so employed was the secondary data sources based on government records, data and reports which revealed that preparing value-added products and popularizing them among the general public can boost the millet demand and farm's income as well.
- Raj Narayan in his paper, *Impact of technological interventions on farmers' income and employment in the Trans-Gangetic Plain region (2024)*, aims to overcome the challenges that a very large proportion of agricultural land does not have the desirable productivity and this diminishes the prospects for reasonable income to the farmers, the study was based on taking the sample of 640 farmers of 32 villages in order to study on their agricultural practices and income for the period 2016-2017 and 2020-21 and the result so concluded was that there was increase in productivity and consequent income of the farmers with varying degrees.
- PK Joshi and Deepak Varshney in his book, *Agricultural Technologies in India: A Review (2022)*, ISBN 978-93-5607-717-1, focused on the adoption levels of improved technologies and their impact on farmers' income, agricultural production, natural resources and environment and the constraints in scaling improved technologies and the conditions for the success of their adoption. The study used reports of World Bank, reports of Ministry of Agriculture and a survey based on the use of agricultural inputs in Indo-Gangetic Plains and use of meta-analysis in order to study the Total Factor Productivity of the selected states in the Indo-Gangetic Plains which hence concluded that the adoption of improved technologies have shown unambiguous positive impact on agricultural productivity and agricultural production.
- Stephan Kloos presented the paper, *The recognition of Sowa Rigpa in India (2016)*, focused on the processes that led to Sowa Rigpa's recognition and situates them at the confluence of economic interests and political strategies within a larger historical and cultural context and is based on ethnographic and archival data collection method by the Indian and Tibetan medical community and the result so found that Sowa Rigpa is legitimately claimed and officially recognized as the Indian system of medicine.
- Resham Bhambhani a researcher with Strat News Global presented a report (2024), *India -Tibet Ties higher than Himalayas*, which aims to focus on Chinese efforts to Sinicize Tibet and curtail the religious freedom of the people and so utilizes the historical research method using archaeological and historical evidences and hence concluded that India significantly influenced the Tibetan traditions and culture due to the deep bond Tibet shared with India as the birthplace of Buddhism.
- International Campaign for Tibet published an article (2023), *India should formalize a holistic approach to its Tibet Policy*, highlights the multifaceted nature of Indian connection to Tibetan affairs and through its descriptive analysis reveals that Tibet's Buddhist heritage is the most visible indicator of its historical connection with India and the India's Ayurveda have enriched the Tibetan medical system Sowa Rigpa.
- Jane Buckle in his research paper (2015), *The Evolution of Aromatherapy*, focuses on usefulness of Tibetan medicines as aromatic herbs and it reveals that traditional Tibetan medicine known as Sowa Rigpa is based on Buddhist tradition of India and is practiced in India and its Himalayan region as well.
- Asha Devi Sukumaran Sreekala published a research paper on *,Millet Production and Consumption in India: Where Do we Stand and Where do we go ? (2022)* which aims to examine if the supply of millets would be sufficient to meet the demands in the near future and for this the study used the crop production data from Directorate of Economics and Statistics from 1869-70 to 2018-19 and various rounds of National Sample Survey office data on household consumption expenditure from government of India is been considered and hence it concludes that there will be surplus in case of bajra and small millets while in case of jowar and ragi there will be net deficit in the coming years which is a matter of concern

- Division of Agricultural Economics, ICAR -Indian Agricultural Research Institute presented a paper on *Production and Consumption of minor millets in India-A Structural break analysis* (2017) where it throws light how millets play an important role in rainfed region of the country and how it is resistance to draught and rainfed farming and for this NSSO unit level data were being used and hence the study so revealed that Assam and Bihar have highest consumption of small millets in India and rural areas.
- Ministry of Agriculture and farmers welfare ,Government of India published a report in 2022 on *Embracing Millets :The key to enhancing food security and nutrition* which aims to show the significance of millets in terms of agri-diversity and food security and nutrition and why it deserves the world's attention and their resilience in the face of climate challenges and the methodology so employed was the case studies and use of secondary data sources and the result so found that millets played a pivotal role in human civilization as a primary food sources and it yielded their prominence to other cereals like wheat and rice.

Research Objectives

- To have comparative study of millets market trend with other major cereals (for instance rice)
- To study about the market challenges of global millets market
- To study about the growth trends in millets market at global level.

Research Questions

- What kind of market constraints do millets face globally ?
- Does millets have surpassed its market growth rate globally in comparison to major cereals like rice ?
- What are the growth trends in global millets market?

Findings And Sugestions

As in the reports of ICAR 2022 millets including pearl millet , sorghum , barnyard millet , finger millet, porso millets are grown across diverse agro-climatic regions covering around 32 million hectares worldwide. India accounts for about 43% of world production , thus approximating \$10.86 billion in 2022 and targeting to achieve \$15.10 billion by 2030. Whereas when compared with rice though it has shown 30% growth rate in its production in 2023 from the last 10 years but its market due to rising awareness in recent years about millets have shown a slight fall .

Millets Global Market Report (ICAR REPORT 2024)-

Global Millets Production (In Figures)	Area Under Millets	Major Contributors	Global Millets Production (In Percentage)	Export	Annual Cagr
89.17 million metric tonnes	74 million hectares	Sorghum and Pearl millet contributing 90% of millet production	20% of global millet production	5th largest exporter, CAGR at 2.79 %	5.4% forecasted till 2028 and 4.6% till 2024

Sources-ICAR Report 2022

Outreach of India's Export of Millets Market At Global Level

Country	Value (In Us \$ Million)	% Growth on Previous Year
UAE	13.33	28.49
SAUDI ARABIA	10.39	68.38
BANGLADESH	3.69	70.65

LIBYA	2.71	111.01
JAPAN	3.37	23.3
ALL COUNTRIES (TOTAL)	75.43	29.56

Source- Research Paper on Status of millets in India-trends and prospects by Sendhil Ramdas of Pondicherry University

Despite this they too faces global market challenges which are as follows-

- a) **Consumer Perception:** lack of consumer awareness , their prolonged cooking times adds to labour cost , mass dietary preference for other major cereals , increasing urbanization , economic disparities , shift in lifestyle more towards urbanization (having more preferences for ready to cook meal) , all of these makes millets a stagnant crop.
- b) **Supply chain inefficiencies**-limited access to value addition opportunities such as processing , packaging , storage hinders their ability to enhance product quality and competitiveness ;lack of strategic investments, price instabilities due to increment in its production and constrains related to its post harvest processing provides hurdles in its commercialization which provides inefficiencies at its various stages of production , processing and marketing ; the large scale dominance of industrial processing threatens small farmers' abilities to access profitable marketable opportunities
- c) **Market Constraints**- The increasing trend of urbanization and rising income levels negatively impact the demand for traditional cereals such as millets whose per capita consumption declined to 7 kg per capita in rural areas and 4kg per capita in urban areas. Lack of policies support , comprehensive strategies all of which are necessary for processing , storage , conditioning and packaging .
- d) **Global Trade Challenges**-The global trade has undergone significant shifts between 1963 and 2021 ; Asia's global millet trade remained static at 26.20% due to high domestic consumption ; India one of the largest millet consumers but still it cultivates on small landholdings and mainly for its subsistence .The complex global millet trade necessitates a thorough understanding of trade barriers , regulatory challenges and market integration efforts to enhance profitability and sustainability of millet commerce worldwide.

But apart from all such challenges , with the help of active government policies and initiatives the global value chain of millets is shifting from traditional , localized to a high-value organised market driven by health consciousness and climate resilience .India as per FAO leads production 38% share which includes cultivation , processing, branding and processed product manufacturing.

Therefore , coming to the general conclusion that the following research questions or hypothesis mentioned as above millets do face certain constraints in their value chain , which are with the time passing by are being under controlled to a certain extent . With comparison to major cereals like rice they do have surpassed them and their growth trends have shown a positive landmark.

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3. Jeetendra Prakash Aryal , M.L.jat, Tek B.Sapkota, Arun Khatri-Chhetri, Menale Kassie, Dil Bahadur Rahut, Sofina Maharjan published an International Journal : *Adoption of multiple climate-smart agricultural practices in the Gangetic plains of Bihar, India* ; in April 2018; ISBN number- 1756-8692 ; its purpose is to adopt the climate-smart agricultural practices for sustainability of Indian agriculture ;in this study the multivariate and probit models are being utilised and the result of the study shows that farmers who face high temperature as the major climate risk factor are more likely to adopt crop diversification and minimum tillage.

4. Netrapal Malik Scientist , Manoj Kumar Singh Associate Professor ,BANARAS Hindu University , Ashok Kumar Senior Scientist and Head Aligarh, in 2023 published an article : *Farmers' readiness for organic farming : A study of Aligarh district in Uttar Pradesh* ; it aims to access the readiness of farmers for organic farming in terms of availability of manpower , inputs and sufficient knowledge , for this study multistage sampling method was undertaken which henceforth included 240 farmers of Aligarh and the outcome of the study so found was that landholdings of maximum number of respondents was less than 2.00 hectares and the source of irrigation for most of the respondents was electricity operated tube well and canal.
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