

The international year of millets 2023: A multi-dimensional opportunity for India

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Abstract

Millets are very significant part of Indian agriculture and the oldest crop known to humankind. These food grains are the most beneficial for health, since they are gluten-free and good for the digestive system as well as protect us from various diseases. Ayurveda describes millets under kudhany varga with their various properties.

Millets are hardy grains that prosper in semi-arid climates. The majority of cultivars have higher iron contents than both rice and wheat and offer more protein than rice. Despite the long tradition of millet intake in India, between 1972-1973 and 2004-2005, consumption of pearl millet or Bajra fell by 67 per cent in urban areas and by 59 per cent in rural ones. Study found that Jowar, bajra, maize, and ragi provided 23 per cent of India's grain needs in 1983 but only 6 per cent in 2011.

Millets are known to be rich of iron, low glycaemic index, high protein and mineral content along with other nutrients that may help to protect and prevent health by behaving as a regular diet supplement. Enhancing its production, we can achieve multidimensional benefit. It may play a game changer for farmers economy along with a substitute for food security. Government have continued some projects to popularise millets intake as a substitute food and addressing millet as Srianna.

Key word: Millet; Food grain; Economy; Health benefit

1. Introduction

The year 2023 was declared as the International Year of Millets by the United Nations General Assembly [UNGA], sponsored by India and supported by more than 70 countries. Food and Agriculture Organization calls it will be an opportunity to raise public awareness about the health and nutritional benefits of millets and its suitability for cultivation under adverse conditions.

It is observed that millets have multidimensional benefit to India in various ground. As per its nutrition value it may establish a benchmark towards life style disorders and malnutrition condition. They are climate-resilient and suit dryland farming. So, it may have a great opportunity to promote for millet cultivation in dry and unused lands. It will increase production of food grains and boost the individual farmer and also the Indian economy. Similarly, very less water and minimum time is required for them may gave prevent ground level water. They are also related to culture as they are an integral part of food habits since ancient India. Millets are described under Dhanyavarga in Ayurvedic literature in various categories like kudhanya, kshudradhanya and trinadhanya.

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Apart from holding an international campaign, there was a dire need to focus on production aspects. So, in this the International Year of Millets, we need to plan well to expand the area under cultivation of millets by creating awareness among farmers and promote millets as a major component of the food basket.

1.1. Millets

Millets are hardy cereal grains belongs from Poaceae (Gramineae) family commonly known as grass family of monocotyledonous flowering plant. Millets are classified in two types as i) major millets includes Sorghum, Pearl, Finger and ii) minor millets like- Foxtail little, guinea, brown top etc. Sorghum -Jowar Pearl millet- Bajra, Finger millet- Ragi and Foxtail millet - Kangni are the important millets grown in India and known as Yavnal, Nali, Nartaki and Kangu or Priyangu respectively in Ayurvedic texts. These are suitable for semi-arid conditions, making them the perfect crop for areas where water management is a concern in harsh environment. Most varieties of millets contain more protein than rice, and they are superior to both rice and wheat in terms of iron and fibre content. Millets are starchy grains contains carbohydrate along with vitamins and minerals.

Millets are counted as one of the oldest food grains and consumed as prime food since ancient time. Presently 1/3 rd. of world's population consumes Millets. Despite a long tradition of millet intake in India, between 1972-1973 and 2004-2005, consumption of pearl millet or Bajra fell by 67 per cent in urban areas and by 59 per cent in rural ones. Another study found that Jowar, bajra, maize, and ragi provided 23 per cent of India's grain needs in 1983 but only 6 per cent in 2011 millets as their food habit. Fortunately, production and consumption of millets shown a significant improvement from the year 2018. In India we found that Sorghum, Pearl, Finger and Foxtail are cultivated largely.

1.2. Sorghum

Sorghum is a grass species known as great millet Jowar cultivated for its grain which is used for food. This is the world's 5th most important cereal crop after rice, wheat maize and barley. It is. One of the most drought resistant crops. Sorghum is rich in minerals like phosphorus, potassium and zinc. It is the finest substitute of wheat and rice when it comes to nutrition because it has a high level of protein, thiamine, niacin, riboflavin and folate. India is the second largest producer of sorghum with yield of 840kg per hectare with compare to the world average 1435kg per hectare. Maharashtra, Karnataka, Rajasthan, Uttar Pradesh, Tamil Nadu and Andhra Pradesh are the major production states of India.

1.3. Pearl

Pearl millet known as bajra is the most widely grown type of millet well adapted to growing area. Characterised by drought, low soil fertility, low moisture and high temperature with tolerance too difficult to growing condition. Pearl Millet is a very important crop in India. It contains more Protein and fibre compare to other millets. India is the first place in bajra production in the world with 791kg/ha. Rajasthan, Maharashtra, Uttar Pradesh, Gujarat, Andhra Pradesh and Punjab are the main producer states of India.

1.4. Finger

Finger Millet Commonly known as ragi. Wildly cultivated in India is a short-day plant. Ragi flour is far better than wheat. It is a balanced diet Promotes health. It contains. 8% of protein. 20% dietary fibre. And. Up to. 4% minerals. The fibre content helps improving digestion system. India is the lead producer of ragi. It is extensively grown in Karnataka, Tamil Nadu, Andhra Pradesh, Odisha Bihar, Maharashtra.

1.5. Foxtail

Foxtail millet is commonly known as kangni. It has been a staple diet of southern India. It is a warm season drought tolerance crop, grain harvested in 75 to 90 days typically yield 800 to 900 kg/acre. It is widely grown in Andhra Pradesh, Karnataka, Tamil Nadu, Maharashtra, Rajasthan, Uttar Pradesh, Bihar and Odisha.

The quality and effect of millets are described as Kashay Madhur in Rasa, Katu in Vipak, Sheet veerya, Laghu-Ruksha Guna with the quality like Lekhana, Vrishya, and Kledashoshan in general in Ayurvedic texts.

1.6. Multidimensional benefit of millets

Millets have multidimensional benefits in the field of health care sector with their nutritional value, dry land crop with short duration yield helps the farmer more production and economy boost, more production will help to face the challenge the food security.

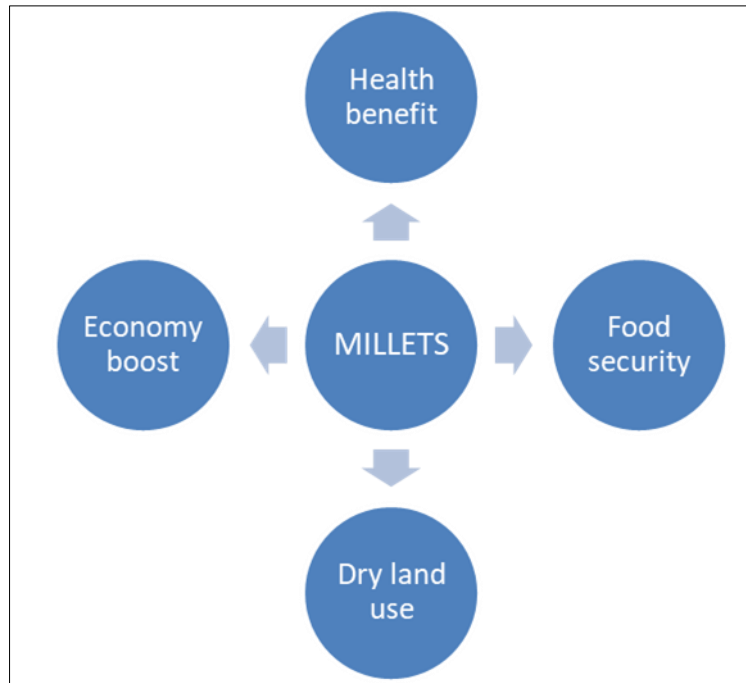


Figure 1 Multidimensional benefits of millets

1.7. Nutritional value and Health benefit

Millets are the group of small-seeded grasses that widely cultivated in many parts of the world. These are the gluten-free and nutrient-dense grain that rich in vitamins, minerals, fibre, and antioxidants has been shown to have numerous health benefits.

1.7.1. Cardiovascular Disease

India has one of the highest Burden cardiovascular diseases worldwide. The annual number of deaths from cardiovascular disease in India raised 2.26 million in 1990 to 4.77 in 2020. CVD risk factor like hyper tension, abdominal obesity and diabetes are higher among Indians even at young age and rapidly raising in urban and rural area. This is really a big challenge. Millets are rich sources of magnesium that help in alleviating blood pressure and the risk of heart strokes, especially in atherosclerosis. The potassium found in millets keeps blood pressure low by functioning as a vasodilator and mitigating cardiovascular risk.

The plant lignans prevalent in millets can convert into animal lignans in the presence of microflora in the human digestive system and safeguard against heart disease.

The high fibre content in millets is pivotal in lowering cholesterol, eliminating LDL from the system and boosting the effects of HDL. with their high fibre lowers cholesterol levels, reduces blood pressure, and improves heart health.

1.7.2. Diabetes, obesity and metabolic syndrome

India is often referred to as the diabetic capital of the world. Age is account for 17% of the total number of diabetes patient in the world. There are currently 80 million people with diabetics in India and the number is expected to increase one 35 million by 2045 including children which is a alarming condition. Children are developing obesity and metabolic syndrome early due to changing dietary habit more processed and fast food.

Finger millet-based diets have demonstrated a lower glycaemic response because of richness in fibre, and also alpha-amylase inhibition characteristics, which reduce starch digestibility and absorption. The competence of insulin and glucose receptors in the body increases by the significant levels of magnesium content prevalent in millets and help prevent diabetes and obesity. So, include of millets in regular diet will help to regulates blood sugar levels, improves insulin sensitivity reduces risk of obesity and became helpful for management of these conditions.

1.7.3. Anaemia

According to National Family Health Survey 2022 more than half of the women 57% and in 25% of male India have anaemic. As per this survey at least 67% of children have anaemia compared to 58.6% in 2015.

Millets are known to be rich of iron have a major impact on iron status, haemoglobin level, high protein and mineral content along with other nutrients that may help prevent and treat iron deficiency anaemia especially pearl and finger millet.

1.7.4. Gastrointestinal disorder

High fibre contain of millets promotes digestive health and eliminates constipation, gases, cramping and bloating.

1.7.5. Cancer

Many antioxidants found in millets can neutralize the free radicals that lead to cancer and dispose of other toxins from the body, especially in the kidney and liver which reduces risk of cancer.

1.7.6. Celiac Disease

Immune compared diseases are a new challenge now a days. Gluten, a bad protein mostly found in wheat which is a prime diet habit for all. Millets are Gluten-free grain that can be used as an alternative to wheat and other gluten-containing grains which may lead to prevent the celiac disease.

Table 1 The nutritional value of millets

Nutrition/100 gm	Sorghum	Pearl	Finger	Foxtail	Paddy	Wheat
Fibre g	2	2.3	3.6	6.7	1	2
Fat g	3.1	4.8	1.3	4.3	0.5	1.5
Protein g	10.4	11.8	7.3	12.3	6.8	11.8
Mineral g	1.2	2.2	2.7	4	.6	1.5
Iron g	3.36	8	3.9	2.8	.7	3.5
Calcium mg	13	42	350	31	10	30
Carbohydrate g	72.1	67.5	72.6	60.9	78.1	71.2
Energy kcal	352	361	336	331	345	346
Thiamine mg	.33	.33	.42	.59	.06	.45
Riboflavin mg	.096	.25	.19	.11	.06	.17
Niacin mg	3.7	2.3	1.1	3.2	1.9	5.5
Folic Acid mcg	20	45.5	18.3	15	8	36
Vitamin E mg	0.5	—	22	—	—	—

1.8. Food security and Millet

According to UNO, India there are nearly 195 million undernourished people in India, which is quarter of the world's hunger burden. India ranks 68 out of 113 major countries in terms of Food Security Index 2022. Food security refers to ensuring adequate food supply to people, especially those who are deprived basic nutrition. Food security has been a major concern in India. So many welfare schemes including Anntoday Anna Yojna, primary house hold beneficiary, Anganwadi etc. are working to meet the challenge.

Millet is an important crop for food security in many parts of the world, especially in developing countries like India. Millets should be used in place wheat and rice as supply in welfare scheme. Millet is also a staple food for millions of people providing a significant portion of their daily caloric intake.

millet is important for food security due to its drought resistant nature crop, nutritional value, versatility, availability and cultural significant.

1.9. Dry land use and Millet

Dry land use refers to the management and utilization of land in arid and semi-arid regions where water is limited, and rainfall is low. It influences the socio-economic status of farmer. More than fifty percentage of land considered as dry land in India.

Millet is a crop that is well-suited to dry land use, making it an important food source for communities in arid and semi-arid regions around the world. millet is a good choice for dryland use as it said above it is a drought resistant crop with short growing cycle with minimum expenditure and high yield.

1.10. Economy boosts and Millet

Millet can provide several economic benefits, both at the local and global levels. millet can contribute to the economy by

Income generation: Millet can provide a source of income for farmers, especially in rural areas where agricultural activities are a primary source of livelihood. This can help to boost local economies and support the development of small businesses.

Export potential: Millet is increasingly being recognized as a valuable export commodity, especially in regions where it is not traditionally consumed. This can help to generate foreign exchange earnings for countries that produce millet, thereby contributing to national economies.

Job creation: Millet production can create employment opportunities in various sectors, including farming, processing, marketing, and distribution. This can help to reduce unemployment rates, especially in areas where job opportunities are limited.

Environmental benefits: Millet is a low-input crop that requires minimal use of fertilizers and pesticides. As a result, it can help to reduce the cost of agricultural inputs, while also promoting sustainable agriculture practices that are better for the environment.

Overall, the economic benefits of millet can be significant, especially for communities that rely on agriculture for their livelihoods. By promoting the production and consumption of millet, countries can help to boost their local economies, while also contributing to global food security and sustainability.

2. Discussion

Millet is known as coarse grain or Mota annaj though tiny in size because of its nutritional value. Hence seeds of millets are considered as power house of nutrition. After analysing the component of millet, it gives a clear view that they are rich in fibre, protein, iron, and essential minerals with less in carbohydrate. The magnesium and potassium present in millet protect the heart. Fibre rich millets lowers the glycaemic index be a good food habit for diabetic mellites person and also for obeys person. It's loaded iron and anti-oxidant is very much use full in eradication of anaemic status and anti-oxidant reduces the risk of several cancer. Besides these millets, the dryland, drought resistant, short duration and low expensive crop with its huge cultivation, will improve the economy of individual farmer and to meet the food security challenge of India.

3. Conclusion

The International Year of Millets is a significant event that has been declared by the United Nations to raise awareness about the importance of millets as a source of food security, nutrition, and sustainable agriculture. The focus of the year is on promoting the production and consumption of millet by as regular food habit will able to meet the global challenges such as life style disorder disease, anaemia, malnutrition food insecurity, and climate change. "It is an excellent replacement for rice since it offers a very similar texture and has a lower glycaemic index, making it as millets are healthier alternative to rice and wheat. Large scale production will improve the socio-economic condition of farmer individually and boost the national economy.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Reference

- [1] "Home | International Year of Millets 2023 | Food and Agriculture Organization of the United Nations". International Year of Millets. Retrieved 2023-02-15.
- [2] Kumar, K. Bharat (2023-01-11). "Watch | Business Matters | Why did UN declare 2023 as International Year of Millets?". The Hindu. ISSN 0971-751X. Retrieved 2023-02-15.
- [3] Mishra, Prabhudatta (2023-01-04). "How the International Year of Millets will boost Indian millets". Business Line. Retrieved 2023-02-15.
- [4] "Nutritional Health Benefits of Millets" (PDF). Indian Institute of Millets Research. Retrieved 2023-02-15.
- [5] Acharya Charaka. Sutrasthana, Annapanavidhi Adhyaya. In: Vaidya Jadavaji Trikamji Acharya(ed) Charaka Samhita. Delhi: Chaukhamba Prakashan;2011.p.154-155
- [6] Bhavamishra. Dhanya varga In:Srikantha Murthy,K.R (ed) Bhavaprakasha. Varanasi: Chowkamba Krishna Das Academy ;2011.p.374
- [7] Acharya Kaiyadeva. Dhanya varga. In: Prof Priya Vrat Sharma, Dr Guru prasada Sharma(eds) Kaiyadeva Nighantu(Pathyaapthya vibhodika). Varanasi Chowkhambha Orientalia;2009.p.301
- [8] Tripathi, Shailja (2023-02-03). "Budget 2023-24 Encourages Millets And Good Health". Outlook Planet. Retrieved 2023-02-18.
- [9] Post, Agriculture (2023-01-26). "Indian delegation visits Nigeria for taking South-South Cooperation on millets to next stage". Agriculture Post. Retrieved 2023-02-18
- [10] Mulder CJ, van Wanrooij RL, Bakker SF, Wierdsma N, Bouma G (2013). "Gluten-free diet in gluten-related disorders". Dig. Dis. (Review). 31 (1): 57–62. doi:10.1159/000347180. PMID 23797124. S2CID 14124370.
- [11] The story of millets millet were the first crops millet are future crops.published by Karnataka state Department of Agriculture, Bangluru, India with ICAR Indian institute of millet Research, Hyderabad.
- [12] Anonymous Vision 2050 . Indian Institute of millet Research ICAR Rajendranagar, Hyderabad 500030 (assessed online) 2015.
- [13] Significance of millet in nutrition, health and value added products: A Review: Journal of Environmental science, computer science and Engineering.
- [14] Nutritional aspects and health benefits of millets. Vol.3 Issue-5 multidisciplinary e-news later e- ISSN:2582-8223.
- [15] Rai S, Kaur A, Singh B (April 2014). "Quality characteristics of gluten free cookies prepared from different flour combinations". J Food Sci Technol. 51 (4): 785–9. doi:10.1007/s13197-011-0547-1. PMC 3982011. PMID 24741176.
- [16] Saturni L, Ferretti G, Bacchetti T (January 2010). "The gluten-free diet: safety and nutritional quality". Nutrients (Review). 2 (1): 16–34. doi:10.3390/nu2010016. PMC 3257612. PMID 22253989.
- [17] Collett, Ian J. "Forage Sorghum and Millet" (PDF). District Agronomist, Tamworth. NSW Department of Primary Industries. Archived (PDF) from the original on 22 August 2008. Retrieved 7 November 2013.
- [18] Lonewood Trust. "Shirohie Millet Growing Guide" (PDF). Archived (PDF) from the. original on 9 October 2022. Retrieved 7 November 2013.
- [19] "Raw millet per 100 g, Full Report". USDA National Nutrient Database, Release 28. 2015. Retrieved 3 December 2015.
- [20] Millets 2009 (PDF). India: National Forum for Policy Dialogues. p. 4. Archived (PDF) from the original on 28 September 2020. Retrieved 17 September 2021.