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The Role of Millet Production and Processing in India

R. Selvamani
Research scholar, Ethiraj college for women Chennai- 600 008

ABSTRACT

Global is facing agrarian as well as dietary challenges. Climate change, water scarcity ,population growth, decreasing yields of major cereals, sufficient access to enough food, the strengthening of local agro food system are a challenge for scientists and nutritionists to explore the possibilities of developing ,processing and using other potential food sources to end hunger and poverty. Millets are downpour nourished yields and are developed in areas with low precipitation and more prominent significance for supported farming and nourishment security . India ,Niger and China are the worlds' largest producer of millet, accounting for more than 55 percent of global production. In India the millet production was 16.14 million tons in 2016-17. India is the worlds' largest producer with a global market share of 41.04 percent. The main aim of the paper is to study the role of production of millets, health benefits of millets and to examine the millet processing in India .The main aim of the paper is to study the role of production of millets, the health benefits of millets and to examine the millet processing in India.

Key words: Agro food system, health benefits , millet processing

1. INTRODUCTION

Coarse grain is a traditional grass groups in Asia to serve as a staple food. Small coarse grain varieties suitable to grow in the climate of India. Because of their longevity, capability of growing in reasonable soil and humidity conditions. In the last year consumers are very conscious of what they eat, especially as people with sugar and obesity are shifting towards millets. It is necessary to analyze the status of production of millets by means of trend in yields. It has all nutrients and minerals even better than other cereals like rice and wheat. Strengthening this sector by promoting the growth of its agri- business has major implications for the improvement of livelihoods in India. Global millet consumption decreased at a rate of 0.9 percent and is expected to positive movements in 2019-24. For many years, India has been the worlds' largest producer of millet. However, millet production in Africa has increased dramatically in recent years. African countries, mainly Niger, Mali, Nigeria, Burkina Faso and Sudan account for more than 40 percent of Global consumption.

2. PRODUCTION OF MILLETS IN INDIA

Important millet crops grown in India are Sorghum (Great millet), Bajra (Pearl millet), Ragi Korra, Little, farmyard and Kodo millet. These often referred to as coarse grains. In 2010, the global production of pearl millet was 32.8 MT and it was decreased about 28.4 MT in 2014.In Asian countries it was rose to 52.25 percent from 48.72 percent in 2010. Indias' average annual output of millet amounted to17,79 million tons between 2010-11 and 2014-15. Madhya Pradesh has the highest small millet are(32.40 percent). Uttarakhand has a maximum productivity of 1174 Kilogram per Hectare, preceded by TamilNadu 1067 Kilogram per Hectare and Gujarat 1056 Kilogram per Hectare in 2009-14.

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In TamilNadu and Gujarat finger millet is the main crop, but in Telangana it is small crop. Millet has an area of 15,48 million hectares, producing 17.2 million tons with yield of 1111 kg/ha in India (Department of Economics and Statistics,2015).Maharashtra,Rajasthan and Karnataka are Indias' top millet growing states. In 2019 is considered as a International Millet year announced by Food and Agriculture Organisation . India celebrates 2018 as the Millet Year. In the last three decades sorghum and other millets consumption has decreased drastically.

In India, sorghum production is decreased in 2010-11(7 MT) But it was reduced to 4.2MT in 2015-16, production of bajra decreased from 10.4 million tons to 8.1 million tonnes, output of ragi reduced to 2.2 million tonnes to 1.8 million tonnes ,and production of small millet decreased fr0.39 million tonnes from 0.44 million tonnes in the same period.

3. THE REASON BEHIND FALL IN PRODUCTION OF COARSE CEREAL

- ❖ poor policy support for coarse cereal
- ❖ Ffavourable policies for the cultivation of oilseeds like sunflower and soybeans, and cash crops such as cotton
- ❖ Easy availability of rice and wheat at a subsidized rate through PDS, the social status of fine cereals, the penetration of diversified value- added goods from rice and wheat have resulted in increased consumption of rice and wheat.

Wheat and paddy are considered as non resistance crop than coarse cereals. Marginal and small farmers are benefited in times of climate change and it reduces the risk and uncertainity in crop production. Rising temperature from 6 degree Celsius to 2100 degree Celsius made severe food insufficiency and common droughts, millets as the solution for food security.

AREA, PRODUCTION AND YIELD OF COARSE CEREALS IN INDIA LEVEL (1989-2015)

YEAR	AREA (MILLION HECTARES)	PRODUCTION (MILLION TONNES)	YIELD (KG/HECTARE)
1989-90	37.69	34.76	922
1990-91	36.32	32.70	900
1991-92	33.42	25.99	778
1992-93	34.42	36.59	1063
1993-94	32.82	30.82	939
1994-95	32.17	29.88	929
1995-96	30.88	29.03	940
1996-97	31.81	34.11	1072
1997-98	31.05	30.40	986
1998-99	29.34	31.34	1068
1999-00	29.34	30.33	1034
2000-01	30.26	31.08	1027
2001-02	29.52	33.38	1131

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2002-03	26.99	26.07	966
2003-04	30.80	37.60	1221
2004-05	29.03	33.46	1153
2005-06	29.06	34.07	1172
2006-07	28.71	33.92	1182
2007-08	28.48	40.75	1431
2008-09	27.45	40.04	1459
2009-10	27.68	33.55	1212
2010-11	28.34	43.40	1531
2011-12	26.42	42.01	1590
2012-13	24.76	40.04	1617
2013-14	25.22	43.29	1717
2014-15	25.17	42.86	1703
2015-16	23.78	37.94	1596

Source:Directorate of Economics and statistics

TABLE NO 1

From the table inferred that area of cultivation of millets 37.69 Million Hectares in 1989-90 and the yield was about 34.6 Million Tonnes.In 2015-16 the area has been reduced to 23.78 (Million Hectares) as due to influence of diversified crops of rice and wheat.

RANKING OF COARSE CEREALS IN STATE-WISE IN 2015-16

STATE	AREA (MILLION TONNES)	ALL INDIA (PERCENT)	PRODUCTION (MILLION TONNES)	ALL INDIA (PERCENT)	YIELD (KG/HEC)
Rajasthan	5.83	24.51	5.91	15.57	1014
Karnataka	3.15	13.23	5.70	15.04	1814
Madhya Pradesh	1.92	8.08	3.83	10.09	1994
Uttar Pradesh	1.90	8.16	3.41	8.99	1756
TamilNadu	0.96	3.79	3.39	8.92	3799
Madhya Pradesh	4.61	19.37	3.27	8.62	710
Bihar	0.73	3.06	2.43	6.40	3337
Andhra Pradesh	0.53	2.21	1.85	4.89	3525
Telangana	0.66	2.76	1.82	4.79	2766
Gujarat	0.95	3.99	1.55	4.08	1632
Haryana	0.47	1.98	0.84	2.21	1781
West Bengal	0.17	0.72	0.74	1.94	4305
Himachal Pradesh	0.32	1.36	0.71	1.86	2194
Jammu and Kashmir	0.34	1.44	0.50	1.32	1455

Source: Directorate of Economics and Statistics

TABLE NO 2

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The table indicated that area of millet cultivation of Rajasthan (5.83 Million Tonnes)and the yield(1014Kg/Hec), in the case of West Bengal the area was 0.17 M T but the yield was 4305Kg/Hec

Health benefits of millet

Millet contains minerals like copper, potassium, phosphorus and magnesium Calcium is very high in finger millet .In this way each millet is superior to rice and wheat and is therefore a solution to under nutrition affecting the vast majority of the Indian population

Kodo millet

Kodo (Varagu) millet grows in Uttar Pradesh, Kerala and Tamil Nadu in the south. The millet has high protein(11 percent), less fat (4.2 percent) and rich in fibre (14.3 percent).It is easy to digest and helps to increase the function of nervous system. It has highest B vitamins . Calcium, potassium, iron, magnesium and zinc are the minerals present in the millet..It is also beneficial for person who is suffered from heart diseases, high blood pressure , high cholesterol levels and also diabetes mellitus.

Barnyard millet

It has less amount of carbohydrates and easy to digest ,it is a gift for modern humans engaged in sedentary activities.It has linoleic and palmitic acid .It promotes the higher level of resistance and decrease glucose level in blood and reduce the lipid levels

Pearl millet

It has high proteins (12-6 percent),lipids (4-6 percent). It is good for healthy heart.The antioxidents present in the pearl millet prevent heart diseases. It also develop insulin sensitivity ,effective for controlling diabetes and lower the level of triglycerides. It maintains blood sugar level constantly for diabetic patient in a long period of time.

Finger millet

It prevents starch digestibility and absorption due to high fibre content (Kumari and Sumathi 2002) and also acts as a healer of dermal wound. It increases antioxidant and control sugar level in the blood. It prevents cardiovascular diseases.

Fox tail millet

Foxtail millet (100 grams) contains 12 g 0f moisture,11.2 g of protein, 351 calories, 4gram of fat , 63.2 gram of carbohydrates and 6.7 gram of crude fibre. It has vitamin B1 which helps to proper function of cardiac muscles and slows down the Alzheimer diseases, to develop concentration and memory power .It is known as morale vitamin, supports nervous system and mental perspective. It also slows down wrinkles and age related problems. It has iron ,helps to maintain muscles health, assists brain development to supply oxygen, to cure restless leg syndrome,to manage central nervous system . It has protein which helps to maintain hair health and prevent hair damageand also strengthen tissues,cells and organs in our body.

4. IMPORTANCE OF PROCESSING OF MILLETS

1. Digestibility-Processing is essential to make the dried grains edible and eatable.
2. Food Safety-Cooking inactivates natural contaminants and heat helps to protect from growth of bacteria and degradation of food.
3. Organoleptic properties- Processing make optimal look, taste and texture of food products and to convene the needs of consumer.
4. Convenience- Helps to meet the consumer demand for getting food quickly and easily and
5. Plays a nutritional supplement .

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5. PROGRAMMES TO IMPROVE MILLET CULTIVATION

- Karnataka Government procured finger millet and sorghum from farmers and distributed through PDS.
- 'Anna Bhagya Yojana' scheme aims to supply millet to households in rural area from farmers and give households with PDS cards in low price(KAPRICOM 2014)

6. SUGGESTIONS TO IMPROVE THE MILLET CULTIVATION

- Introduction of mini-kit presentations and state level training programs which would help the farmers to promote newly varieties of seeds by replacing low-yield local varieties.
- The government issued newly variety of seeds should either be free or in discounted rate .
- The non monetary operations should be explained and give trial to farmers in the field.
- In National Security Bill, 40 percent of food security should be allocated to millet farming
- Integration of millet into Public Distribution System.
- Provide mid day meals in schools, welfare hostels twice in a week.
- Agronomic research should be carried out efficiently and bring out low cost technology and easy to adopt.
- Conversion of fallow land into cultivable millet farming.
- Start a educational and promotional programme on millet.

7. EXISTING POLICIES ON MILLETS- INDIA AND TAMILNADU

Millets are specifically included in specific strategies and schemes only. There are no specific government plans, initiatives or limited millet programs.

- Intensive Millets Promotion (INSIMP)
- Rainfed Area Development Programme (RADP)
- Integrated Cereal Development Programmes in Coarse Cereals (ICDP-CC)

8. MILLET PROCESSING IN INDIA

Methods of food processing to improve nutritional quality and bioavailability of nutrients by reduction o anti-nutrients. Decortication, milling, boiling, frying, germination, fermentation, malting. baking are the techniques used in processing of millets. Small millets are grown in semi-arid areas in India. Processing of small millets in industries are under developed than processing of rice and wheat.

- Dry milling

Coarse grain flour are made in roller mill using dry millets. It is a simple method used all over the world . Germs can be pressed in dry milled and removed with a solvent then to recover oil.This type of processing require low capital investment than wet milling.

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- Wet milling

In United States of America, wet milling is popular in many regions.The important by products of the milling are Ethanol and Fractose com syrup.

- Alkali processing

Solution of water and lime used in the processing and at 900 C for 50 minutes takes time for cooking the cereals. Marination of coarse grain is for 14 hours time, fresh water has been used for washing to remove residual alkali and waste materials from cereals. The stones, dust and dirt are removed then milled the washed grains.

Introduction of 'Quality Assurance, Codex Standards, Research and Development and Promotional Activities' scheme by the Ministry of Food Processing Industries aims to encourage the value added of millet grain food products. The scheme facilitate grants to central and state government departments, private and public funded organizations, recognised private sector Research and Development units to develop value added research and development in food products produced from millet grains.

In millet industry ,the distribution channels play an important role in distribution of millets.Farmer producer organisation have an important role in the production and distribution of products. The work of intermediaries (middlemen) is to lessen the prevalence of e-commerce sites and online stores.

Millet Processing unit was started at Sivarakottai and Kallikudi block of Madurai district in 2015.In this unit the husk and stone remover machine which can process 150 kg of millet per hour. State Planning Commission aims to support the block in processing of millets.

Millet market is highly competitive due to the paeticipation of local suppliers. Sahaja Samrudha Organic Producer, Janadhanya Farmers Producer, Dharani FaM CooP, Shimla Hills Offering, South Indian Grains Corporation, Earthon Products Australia, Dharmapuri District Minor Millet Farmers Producers, Treta Agro, Sresta Natural Biopro ducts and Inner Being Wellness are some of the millet industrys' leading players in India.

Andhra Pradesh Government established processing of millet units in 10 mandlas. This boost the farmer to grow millet in larger area of production. In 2016 , this scheme was introduced and covers East Godavari, Anantapur, Chittoor, Kurnool Srikakula, Visakapatnam, Vizianagaram districts with a total area of 30,351 Hectares. Millet Mission Program initiated by Government of Telangana , for five years duration period to 36 mandlas in 6 districts. Millet Processing units are also started at the gram panchayat and mandla levels.

In Madhya Pradesh, the Government is acting on procuring processing units with a view to popularize millets. In the state 1,250 farmers in 40 villages are in cultivation of millet in marginal areas. The important problem is removing of stones from millet grains.This has been done manually in various part of India.

9. CONCLUSION

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In Asian continent , India is one of the world major producer of coarse grains. There is a limited public and private investment in development and production of millet seeds. Public cum private investment are limited in development and production of millet seeds. The unstable global millet prices are determined on the basis of amount of supply and generally unrelated to those of other major crops like maize, barley and sorghum. The Government of India could also be a step towards to develop millet grains, leads to boosting of sustainable agriculture and attainment of doubling of farmers income in 2020.

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