

Introduction

Small millets (finger millet, foxtail millet, kodo millet, little millet, barnyard millet and proso millet) are crops of antiquity having a long history of cultivation of more than 5000 years and are known for their suitability to dry lands, hill and tribal agriculture contributing to food, fodder and nutritional security at farm and regional level. They require small quantity of water, mature early and well suited for cultivation under scarcity conditions. They are considered as nutria-cereals and are a source of food, feed and fodder. They are grown from sea level to mid hills right from Tamil Nadu in the South to Uttarakhand in the North, and Gujarat in the West to Arunachal Pradesh in the Northeast.

Small millet crops are viewed as important for health and wellness of people and can help in preventing many kinds of diseases related to modern life style including obesity, diabetes. Of late, plenty of elite food chains have begun selling millets and millets based products on their shelves as health food. Small millets can be further processed towards various foods such as flakes, quick food cereals, ready to eat snacks, supplementary foods, extrusion cooking, malt based products, weaning foods and more importantly health foods. The importance of regular food use of nutrient dense millet for achieving a holistic food and nutritional security is widely recognized.

The total area under these crops during the year 2015-16 was 1.79 m. ha with a production of 2.21 m. tons. . The finger millet alone occupied 1.14 m ha with a productivity of 1.82 m. tons and productivity of 1601 kg/ha.

Sate-wise area, production and productivity of Finger millet in India: 2015-16

States/UTs	Area (In ' 000 Hectare)	Production (In' 000 Tonne)	Productivity (In Kg./Hectare)
Andhra Pradesh	32.0	34.0	1063
Bihar	6.9	9.9	1429
Chhattisgarh	6.9	1.3	188
Dadra and Nagar Haveli	0.9	1.6	1900
Goa	-	-	-
Gujarat	19.0	15.0	789
Himachal Pradesh	1.9	1.9	1027
Jammu and Kashmir	-	-	-
Jharkhand	14.3	9.2	644
Karnataka	705.0	1188.0	1685
Kerala	0.1	0.1	1180
Madhya Pradesh	1.0	1.0	1000
Maharashtra	92.0	93.0	1011
Nagaland	0.3	0.3	970
Odisha	45.7	28.3	620
Puducherry	-	-	-
Sikkim	2.9	3.0	1042
Tamil Nadu	90.0	271.2	3013
Telangana	1.0	1.0	1000
Uttar Pradesh	-	-	-
Uttarakhand	107.4	150.6	1402
West Bengal	11.0	12.5	1136
India	1138.2	1821.9	1601

State-wise area, production and productivity Small millets in India: 2015-16

States/UTs	Area (In ' 000 Hectare)	Production (In' 000 Tonne)	Productivity (In Kg./Hectare)
Andhra Pradesh	51.0	49.0	961
Arunachal Pradesh	27.5	27.6	1002
Assam	6.6	4.4	674
Bihar	1.8	1.3	756
Chattisgarh	94.8	15.0	158
Dadra and Nagar Haveli	-	-	-
Goa	-	-	-
Gujarat	18.0	20.0	1111
Himachal Pradesh	4.2	3.0	728
Jammu & Kashmir	5.9	2.3	395
Jharkhand	-	-	-
Karnataka	28.0	10.0	357
Kerala	0.0	0.0	714
Madhya Pradesh	180.0	73.3	407
Maharashtra	76.0	31.0	408
Meghalaya	2.9	2.8	950
Nagaland	8.7	9.8	1122
Odisha	25.4	12.7	501
Punjab	-	-	-
Rajasthan	13.9	6.7	482
Sikkim	3.6	3.5	980
Tamil Nadu	31.3	36.4	1164
Telangana	1.0	1.0	1000
Tripura	0.1	0.1	820
Uttar Pradesh	8.0	5.0	625
Uttarakhand	59.0	74.3	1259
West Bengal	2.3	1.7	733
India	649.9	390.9	602

Source: Ministry of Agriculture and Farmers Welfare, Govt. of India. (ON1394)

Area, production and productivity trends

Five-yearly analysis of data indicates a steady decline in the area from 7.56 m ha during 1951-55 to 1.86 m ha during 2011-15; with a drastic decline in the area of small millets other than finger millet from 5.29 to 0.69 m ha. The production of finger millet fluctuated between 1.61 m t in 1951-55 and 1.87 m t in 2011-15 with high of 2.65 m t during 1976-80 despite huge reduction in area. This was due to doubling of productivity of finger millet from 704 kg/ha to 1601 kg/ha and wide spread cultivation of high yielding blast tolerant varieties. From the inception of the project in 1986, the productivity increase was 47% in finger millet and 39% in other small millets, but reduction area was 50% in finger millet and 75% in other small millets.

Table 1: Quinquennial area, production and productivity of small millets in India

Year	Finger millet			Small millets		
	Area ('000 ha)	Production ('000 t)	Productivity (kg ha ⁻¹)	Area ('000 ha)	Production ('000 t)	Productivity (kg ha ⁻¹)
1951-55	2274	1605	704	5290	2177	410
1956-60	2454	1873	764	5022	1955	389
1961-65	2555	1888	743	4677	1889	404
1966-70	2420	1887	779	4741	1784	376
1971-75	2442	2227	909	4489	1745	388
1976-80	2588	2650	1021	4326	1743	402
1981-85	2474	2612	1054	3459	1391	401
1986-90	2306	2510	1088	2754	1198	437
1991-95	1891	2511	1331	1950	851	439
1996-00	1718	2413	1402	1492	738	435
2001-05	1563	2088	1331	1173	510	435
2006-10	1350	1976	1471	970	467	480
2011-15	1169	1873	1601	695	419	606

After years of neglect, small millets, which can suitably designated as climatic resilient crops or climate smart crops or nutri-cereals are now receiving more attention in agricultural R&D agenda in the country. Rich diversity of small millets crops has made them well suited for contingency crop planning and also to address the issues of climate change. The plasticity exhibited has made them flexible for apparent early as well as delayed planting, very low and high rainfall areas, various elevations and different soil regimes. These positive features have not been duly recognized and exploited in the country. The versatile small millets like foxtail millet, barnyard millet, proso millet and little millet would fit in any situations of climatic change and would save the farmers from a total crop failure. The farmers who had shifted from millets to other crops are keen to go back to millets in view of the stable harvests ensured, easy crop production, drought resistance, and eco-friendly production.

The future research priorities in small millets are utilization of trait specific germplasm, basic and strategic research for resistance to biotic (blast in finger millet, shoot fly in little, proso and foxtail millets) and abiotic stresses (drought, temperature, salinity), varietal diversification, development of parental lines and hybrid technology in finger millet /foxtail millet, gene discovery and allele mining from small millet genetic resources, developing innovative water moisture conservation practices, crop geometry, efficient nutrient management and precision farming, IPM technology for mitigating menace of shoot flies in little, barnyard, kodo and proso millets, selective mechanization of key operations like ploughing, inter cultivation and harvesting and value addition to increase the utility of small millets in food, feed and other allied industries and development of suitable versatile milling machinery for small millets.

In this report, the results of coordinated trials of all disciplines in six small millets crops are discussed. The aspects include evaluation of improved genotypes across locations, their agronomic performance, moisture conservation practices, cropping sequence and intercropping studies and identification of donors/tolerant sources for important diseases and insect-pests of small millets. Impact of frontline demonstrations and Tribal sub-plan programmes in different states and also efforts of the project in popularization of small millets in North Eastern Hilly region also find a place in this report. The research progress made is reviewed and technical programmes for ensuing kharif 2018 will be formulated.