

Introduction

Small millets are a group of six crops comprising of finger millet, kodo millet, little millet, foxtail millet, barnyard millet and proso millet. They are considered as nutri 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. The crops are grown in a variety of agro-ecological situations viz., plains, coast and hills as well as in diverse soils and varying rainfall. They are known for resilience and drought enduring capacity and are relatively less prone to major pests and diseases. These are indispensable in tribal and hill agriculture where crop substitution is difficult.

The total area under these crops during the year 2014-15 was 1.80 m ha, of which finger millet alone occupies 1.21 m ha. Five-yearly analysis of data indicates a steady decline in the area from 7.56 m ha during 1951-55 to 1.92 m ha during 2011-15; with a drastic decline in the area of small millets other than finger millet from 5.29 to 0.73 m ha. The production of finger millet fluctuated between 1.61 m t in 1951-55 and 1.94 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 1656 kg/ha and wide spread cultivation of high yielding blast tolerant varieties.

Finger millet

Area, production and productivity in Finger millet in recent years (Average of 2009-10 to 2014-15)

State	Area (lakhs ha)	Production (lakhs tons)	Productivity (kg/ha)
Karnataka	7.02	13.25	1887
Maharashtra	1.25	1.34	1070
Uttarakhand	1.22	1.68	1372
Tamil Nadu	0.87	2.24	2580
Other states	1.66	1.40	843
All India	12.02	19.91	1656

- The major finger millet growing states are Karnataka, Uttarakhand, Maharashtra, Tamil Nadu, Odisha, Andhra Pradesh and Gujarat. Of the total area under finger millet Karnataka alone occupies 58.4% followed by Uttarakhand and Maharashtra with 10% each.
- Karnataka contributes nearly 66.5% of finger millet production in the country followed by Tamil Nadu and Uttarakhand with 11.2% and 8.4%, respectively. Tamil Nadu has the highest productivity (2580 kg/ha), followed by Karnataka (1887 kg/ha) and Uttarakhand (1372 kg/ha).

Other Small Millets

- In other small millets, the area declined is very drastic leading to lowering of production without any visible increase in productivity. This is largely attributable to confinement of these crops to marginal areas, non availability of quality seed of improved varieties and poor extension support.

Area, production and productivity in other Small Millets in recent years (Average of 2009-10 to 2014-15)

State	Area (lakhs ha)	Production (lakhs tons)	Productivity (kg/ha)
Madhya Pradesh	2.24	0.79	352
Chattisgarh	1.12	0.29	258
Uttarakhand	0.71	0.88	1239
Maharashtra	0.59	0.30	508
Gujarat	0.43	0.46	1069
Other states	1.65	1.41	854
All India	6.74	4.13	613

- Madhya Pradesh (33.2%) has the largest area under other small millets, followed by Chattisgarh (16.6%) and Uttarakhand (10.5%). Uttarakhand and Madhya Pradesh contribute 21.3% and 19.1% of small millets production which is closely followed by Gujarat 11.1%. Productivity of other small millets as a whole is high in Uttarakhand and Gujarat

In spite of the extraordinary nutritional qualities of millet grains and capacities of millet farming systems, the area under millet production has been shrinking over the last five decades. The period between 1961 and 2009 saw a dramatic decrease in cultivated area under millets, more so in case of small millets (80% for small millets other than finger millet, 46% for finger millet). The area under all small millets other than finger millet has declined drastically in all states and the total production of small millets has declined by 76%. The productivity has remained more or less stagnant in the last two decades. The area declined by 83% from first five year plan to 12th plan whereas the production also fell by nearly 80%. The productivity of small millets (other than finger millet) remained almost stagnant till 12th plan.

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. 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.

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 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. The research progress made is reviewed and technical programmes for ensuing kharif 2017 will be formulated.