01. IMPORTANCE AND AREA, PRODUCTION AND PRODUCTIVITY OF MAJOR CEREALS, MILLETS, PULSES AND OILSEEDS OF INDIA

IMPORTANCE

CEREALS

The word *Cereal* derives from *Ceres*, the name of the Roman goddess of harvest and agriculture. Cereals are grasses (members of the monocot family Poaceae, also known as Gramineae) cultivated for the edible components of their grain (botanically, a type of fruit called a caryopsis), composed of the endosperm, germ and bran. Cereal grains are grown in greater quantities and provide more food energy worldwide than any other type of crop, they are therefore staple crops.

In their natural form (as in *whole grain*), they are a rich source of carbohydrates, vitamins, minerals, fats, oils and protein. However, when refined by the removal of the bran and germ, the remaining endosperm is mostly carbohydrate and lacks the majority of the other nutrients. In some developing nations, grain in the form of rice, wheat, millet or maize constitutes a majority of daily sustenance. In developed nations, cereal consumption is moderate and varied but still substantial. Globally, more than 2000 m.t. of cereals are produced from about 700 m. ha with the average productivity of about 3000 kg/ha.

PULSES

Pulses may be defined as the dried edible seeds of cultivated legumes. They belong to the family of peas, beans and lentils (Family: Fabaceae). English word pulse is taken from the Latin *Puls*, meaning pouage or thick pap. The pulses are a large family and various species are capable or surviving in very different climates and soils.

Pulses are cultivated in all parts of the world and they occupy an important place in human diet. In India, especially people who are mostly vegetarian depend largely on cereals and pulses as their staple food, which serve as the main source of dietary protein and energy.

Pulses contain more protein than any other plant. They serve as a low-cost protein to meet the needs of the large section of the people. They have, therefore, been justifiably described as 'the poor man's meat'. Their low moisture content and hard test or seed-coat permits storage over long periods. In addition to providing dry pulses, many of the crops are grown for their green edible pods and un-ripe seeds. Nutritionally, immature fruits have distinctly different properties to those of the mature seed; the protein content is lower, but, they are relatively richer in some of the crops are used as pot herbs.

In general, pulses contain 20 to 28% protein with the exception of soybean which has as much as 42%. Their carbohydrate content is about 60% except soybean which has about 30%. Pulses are also fairly good sources of thiamin and niacin and provide calcium, phosphorus and iron. On an average, 100 g of pulses contain 345 Kcal of energy, 24.5 g of protein, 140 mg of calcium, 300 mg of phosphorus, 8 mg of iron, 0.5 mg of thiamin, 0.3 mg of riboflavin and 2 mg of niacin.

OILSEEDS

Oilseeds are important as are the pulses in the country. The principal oilseeds include groundnuts, rapeseeds and mustard seeds. While the former is a *Kharif* crop, depending wholly upon reasonable but timely rainfall, the latter is a *Rabi* crop, fundamentally confined only to non-irrigated areas. As a result their production as well as productivity is subject to climatic variations and market hypotheses. The other oilseeds incorporate sesame, linseed, caster seed, safflower seed, soybeans, sunflower seeds, cotton seeds and copra. Rapeseeds and mustard seeds belong to the wheat belt of north and central India. Groundnut, on the other hand, is grown in west and south India. Gujarat is the dominant producer of groundnut. While population has been mounting at 2% per annum, the demand for oil has been rising at 5% every year.

AREA, PRODUCTION AND PRODUCTIVITY IN INDIA

Rice

State	Area (million hectares)	Rank	Production (million tonnes)	Rank	Productivity (kg/ha)	Rank
West Bengal	5.63	I	14.34	I	2547	
Punjab	2.80		11.24	II	4014	I
Uttar Pradesh	5.19	II	10.81	III	2083	
Andhra Pradesh	3.44		10.54		3064	III
Odisha	4.37	III	6.92		1584	
Tamil Nadu	1.85		5.67		3065	II
Assam	2.50		4.34		1736	
Chattisgarh	3.67		4.11		1120	
Karnataka	1.49		3.69		2477	
Haryana	1.21		3.63		3000	
Bihar	3.21		3.60		1121	
Maharashtra	1.47		2.18		1483	
Jharkhand	1.00		1.54		1540	
Gujarat	0.68		1.29		1897	
Madhya Pradesh	1.45		1.26		869	
Kerala	0.23		0.60		2609	
Others	1.75		3.35		1914	
All India	**41.92**		**89.09**		**2125**	

Source: Directorate of Economics and Statistics, Department of Agriculture and Cooperation (2010-11)

Wheat

State	Area (million hectare)	Rank	Production (million tonnes)	Rank	Productivity (kg/ha)	Rank
Uttar Pradesh	9.67	I	27.52	I	2846	
Punjab	3.52	III	15.17	II	4310	I
Haryana	2.49		10.50	III	4217	II
Madhya Pradesh	4.28	II	8.41		1965	
Rajasthan	2.39		7.50		3138	III

Bihar	2.19		4.57		2087	
Gujarat	0.88		2.35		2670	
Maharashtra	1.08		1.74		1611	
West Bengal	0.32		0.85		2656	
Uttarakhand	0.40		0.85		2125	
Himachal Pradesh	0.35		0.33		943	
Jammu & Kashmir	0.29		0.29		1000	
Karnataka	0.28		0.25		893	
Jharkhand	0.10		0.17		1700	
Assam	0.06		0.06		1000	
Others	0.16		0.25		1563	
All India	**28.46**		**80.80**		2839	

Maize

State	Area (million hectare)	Rank	Production (million tonnes)	Rank	Productivity (kg/ha)	Rank
Karnataka	1.24	I	3.01	I	2430	
Andhra Pradesh	0.78		2.76	II	3527	III
Maharashtra	0.79		1.83	III	2302	
Bihar	0.63		1.48		2341	
Rajasthan	1.10	II	1.15		1044	
Tamil Nadu	0.24		1.14		4686	I
Madhya Pradesh	0.83	III	1.05		1256	
Uttar Pradesh	0.71		1.04		1465	
Himachal Pradesh	0.30		0.54		1839	
Gujarat	0.50		0.53		1072	
Jammu & Kashmir	0.31		0.49		1566	
Punjab	0.14		0.48		3417	
West Bengal	0.10		0.39		3943	II
Jharkhand	0.16		0.19		1169	
Others	0.43		0.65		@	
All India	**8.26**		**16.72**		**2024**	

@ - Since area/ production is low in individual states, yield rate is not worked out.

Sorghum

State	Area (million hectare)	Rank	Production (million tonnes)	Rank	Productivity (kg/ha)	Rank
Maharashtra	4.18	I	3.57	I	854	
Karnataka	1.37	II	1.41	II	1027	
Madhya Pradesh	0.45		0.56	III	1267	I
Andhra Pradesh	0.39		0.44		1135	II
Tamil Nadu	0.24		0.22		929	
Gujarat	0.16		0.17		1049	III

Uttar Pradesh	0.19		0.17		885	
Rajasthan	0.72	III	0.10		145	
Haryana	0.07		0.04		500	
Orissa	0.01		0.01		644	
Others	0.02		0.02		1000	
All India	**7.79**		**6.70**		**860**	

Pearl millet

State	Area (million hectare)	Rank	Production (million tonnes)	Rank	Productivity (kg/ha)	Rank
Rajasthan	5.17	I	2.03	I	394	
Uttar Pradesh	0.85	III	1.39	II	1638	I
Haryana	0.59		0.93	III	1593	II
Gujarat	0.67		0.83		1232	
Maharashtra	1.03	II	0.77		741	
Madhya Pradesh	0.17		0.25		1495	
Karnataka	0.31		0.15		502	
Tamil Nadu	0.05		0.08		1513	III
Andhra Pradesh	0.05		0.05		1178	
Jammu & Kashmir	0.02		0.01		626	
Others	0.01		0.01		@	
All India	**8.90**		**6.51**		**731**	

Area, Production and productivity of total cereals in India (2010-11)

State	Area (million hectare)	Rank	Production (million tonnes)	Rank	Productivity (kg/ha)	Rank
Andhra Pradesh	5.90		18.88	III	3200	
Arunachal Pradesh	0.19		0.32		1690	
Assam	2.64		4.81		1821	
Bihar	5.62		8.68		1544	
Chhattisgarh	4.09		6.52		1592	
Goa	0.14		0.40		2873	
Gujarat	3.64		7.62		2096	
Haryana	4.54		16.47		3628	III
Himachal Pradesh	0.76		1.38		1813	
Jammu & Kashmir	0.90		1.50		1673	
Jharkhand	1.07		1.55		1450	
Karnataka	5.45		12.31		2260	
Kerala	0.22		0.52		2428	
Madhya Pradesh	7.70		11.57		1502	
Maharashtra	8.99	III	12.32		1370	
Manipur	0.24		0.57		2397	
Meghalaya	0.13		0.24		1836	

Mizoram	0.05		0.06		1223	
Nagaland	0.26		0.53		2012	
Orissa	4.44		7.19		1620	
Punjab	6.49		27.85	II	4291	I
Rajasthan	10.31	II	15.57		1510	
Sikkim	0.06		0.10		1563	
Tamil Nadu	2.54		7.35		2897	
Tripura	0.27		0.71		2639	
Uttar Pradesh	17.36	I	45.21	I	2605	
Uttarakhand	0.93		1.76		1906	
West Bengal	5.37		14.29		2664	
A & N Islands	0.01		0.02		2836	
D & N Haveli	0.01		0.02		1867	
Delhi	0.04		0.15		3937	II
Daman & Diu	0.00		0.00		1609	
Pondicherry	0.02		0.05		2599	
All India	**100.36**		**226.54**		**2257**	

PULSES

State	Area (million hectare)	Rank	Production (million tonnes)	Rank	Productivity (kg/ha)	Rank
Madhya Pradesh	4.94	I	4.30	I	871	I
Maharashtra	3.38	II	2.37	II	702	
Uttar Pradesh	2.54	III	1.90	III	748	
Andhra Pradesh	1.93		1.43		740	
Karnataka	2.48		1.12		451	
Rajasthan	3.50		0.71		204	
Gujarat	0.73		0.52		705	
Chhattisgarh	0.81		0.49		604	
Bihar	0.56		0.47		836	II
Orissa	0.87		0.40		461	
Jharkhand	0.32		0.22		709	
Tamil Nadu	0.53		0.20		382	
West Bengal	0.18		0.15		826	III
Haryana	0.13		0.10		758	
Others	0.37		0.27		@	
All India	**23.28**		**14.66**		**630**	

OILSEEDS

State	Area (million hectare)	Rank	Production (million tonnes)	Rank	Productivity (kg/ha)	Rank
Madhya Pradesh	6.77	I	7.64	I	1129	
Rajasthan	4.13	II	4.41	II	1066	

Gujarat	2.79		3.10	III	1109	
Maharashtra	3.88	III	2.81		725	
Andhra Pradesh	2.07		1.50		724	
Karnataka	2.00		1.01		502	
Tamil Nadu	0.50		0.94		1898	I
Haryana	0.53		0.88		1645	II
Uttar Pradesh	1.08		0.82		753	
West Bengal	0.68		0.73		1065	
Orissa	0.29		0.17		589	
Assam	0.28		0.14		526	
Bihar	0.14		0.14		1042	
Punjab	0.06		0.08		1354	III
Others	0.75		0.52		@	
All India	**25.96**		**24.88**		**959**	