Introduction

MADHYA PRADESH is a predominantly agricultural state. It is the foremost state in the production of Pulses and Oilseeds and contributes one-fourth of the national production of these. It also contributes one-fifth of the total production of Cereals. In the production of Gram and Soybean, the state is far ahead of others; as much as 40 percent of the national production of Gram and 60 percent of Soybean comes from here. The state has a share of 20 percent in the national production of Masur.

According to Census 2011, 69.8 percent of the workers in the state are engaged in agriculture. Only Bihar and Chhattisgarh have a higher proportion; the Indian average is 54.6 percent. According to the figures compiled up to August 2013, agriculture comprises 22 percent of the state domestic product (SDP) of Madhya Pradesh. This is low in comparison to the share of workers in agriculture; but there is no other state with a higher share in the SDP. The share of agriculture in the GDP of India is 11.6 percent. These figures are according to 2004-05 prices; in that year, a new series of National Accounts Statistics was started. Since then, share of agriculture in the SDP has been declining for most states; in Madhya Pradesh it has remained nearly unchanged. Meanwhile, the share of workers in agriculture has declined. Thus, the relative economic condition of the agricultural workers in the state has improved; this can hardly be said about many other states of the country.

Agriculture in the state has been improving steadily for the last 3 or 4 decades. In the process, agriculture has been transformed; irrigation, double cropped area and the gross area under crops have grown everywhere; and, the relative proportion of different crops has changed. Area under Oilseeds has greatly expanded, there has been some expansion of Pulses, but the area under Cereals has declined. Among Cereals, Wheat has expanded, but Coarse Cereals have contracted. Among Pulses, area under Gram has increased, that under the other Winter crops of Masur and Peas have also improved somewhat, while the Summer Pulses have declined. Among Oilseeds, Soybean has expanded massively; the Winter Oilseeds crop of Mustard-Rapeseed has also somewhat improved; but all other Oilseeds have become relatively insignificant.

These trends of change and growth have become distinctly sharper during the last 9 or 10 years. In this period, net irrigated area, double cropped area and gross cropped area have expanded rapidly. Production of Wheat and Soybean has doubled. The growth has become even more rapid in the last 3 or 4 years.

The long-term trend-lines given in the penultimate section of this Atlas graphically illustrate the rapid growth of the last about 10 years. But the objective is not merely to present the extraordinary achievements of this latest period of growth; it is to document the transformation of agriculture that has happened in the last about 3 decades. The Atlas presents hundreds of Maps showing several significant parameters disaggregated up to the district level for the 1970s and the early 21st century.

The first two sections present maps of the basic Geography and Demography of Madhya Pradesh. In the section on Geography, the maps of rivers, water-bodies and canals are especially noteworthy. The rivers and their tributaries flowing through every part of the state seem like the network of arteries and veins that sustain life in a human body. The state encompasses basins of six major rivers, including Ganga, Yamuna, Narmada and Godavari. Several canals have been drawn from these rivers, which have facilitated intense cultivation in many districts. In the Soil Maps here, about a third of the geographical area of 30.8 million hectares is seen to fall in the top two classes of Land Capability. Such a large proportion of high quality land is unusual outside the Ganga-Yamuna plains.

Maps concerning Demography are based on the decennial Censuses from 1901 to 2011. Studying these maps along with the maps of land-use and cropping pattern, etc., given in the later sections, offers several insights into the sociology of agriculture.

Land, irrigation and livestock form the foundation of agriculture. Sections 3, 4 and 5 deal with these parameters, respectively. About 28 percent of the total area of the state is under forest, yet 48 percent of the area is cultivated. In several districts, where there is not much forest, the proportion of cultivated area is as high as 70 to 80 percent. Even in districts with more than 55 percent of the area under forest, the share of cultivation remains above 25 percent. The diligent cultivators of the state manage to plough every possible patch of cultivable land. Double cropped area has also expanded rapidly from 1.7 million hectares in 1976-81 to 5.6 million ha in 2005-10; half of this expansion has occurred in the last 8 or 10 years.

Irrigation has vastly expanded. Between 1976-81 and 2005-10, net irrigated area has risen from 1.6 to 6.4 million ha. A major part of this growth has taken place in the last few years. Every source of irrigation has improved. The greatest expansion has taken place in the area under Tubewells; this probably is a consequence of improved availability of electricity. "Other Sources" of irrigation, based largely on conservation of water, have also expanded considerably.

Between the Livestock Censuses of 1982 and 2007, the total number of domestic animals has increased from 32 to 41 million. But animals per 100 persons have declined from 81 to 60. There has been some increase in the number of cows and calves; the number of buffaloes has risen sharply. Bullocks have declined, though their number has increased in several districts, especially in the districts that have a high presence of scheduled tribes. The number of goats has increased; but that of sheep has halved. Growth of buffaloes and goats probably indicates a shift towards commercial animal husbandry. Notwithstanding all this, the state remains ahead of others in the number of cows, calves and bullocks.

The next several sections, from Section 6 to 10, give maps of district-wise area under different crops; these maps are based on quinquennial averages of 1976-81 and 2004-09. In these about three decades, gross cropped area has risen; the summer crop has expanded by 2.1 mn ha and the winter crop by 2.3 mn ha. But the area under Cereals has declined by about a million ha. Area under Pulses has risen by about 0.8 and that under Oilseeds by 4.7 million hectares. (See, Section 6).

Among Cereals, Wheat has expanded by 0.8 mn hectares and Paddy by 0.15 mn ha, but Coarse Cereals have declined by 1.9 mn ha. Among the latter, Maize has expanded by 0.5 mn ha and area under Bajra has remained stable; all other Coarse Cereals have contracted. Cultivation of Jowar alone has contracted by 1.5 mn ha; Kodon-Kutki has lost 0.45 mn ha, and Jau, Sanva, etc., have declined by another 0.25 million hectares. (See, Section 7).

Among Pulses, Gram has expanded by 0.9, Masur by 0.25 and Peas by 0.10 mn ha. Summer Pulses have contracted by 0.45 mn ha. Tuar, Moong-Moth, Lakh, Kulthi, etc., have all declined. Area under Tuar, however, remains considerable; the state contributes 13 percent of the national production of Tuar. Area under Urad has remained nearly unchanged in this period. (See, Section 8).

Among Oilseeds, the expansion is largely in Soybean, which has risen from 0.2 to 4.9 mn ha. Mustard-Rapeseed has expanded from 0.17 to 0.75 and Linseed has contracted from 0.41 to 0.12 mn ha. Area under Groundnut has declined; that under Sesame remains nearly unchanged. (See, Section 9).

Crops other than Foodgrains and Oilseeds have declined slightly from 0.19 to 0.18 mn ha. Fodder crops have declined by 0.3 mn ha; Cotton and Area under Sugarcane have remained stable, but the distribution of the area under these crops across the districts has changed significantly. There is not much cultivation of fruits in Madhya Pradesh; but, there has been some increase in Banana cultivation in Burhanpur. (See, Section 10).

The next section (Section 11) describes per capita production of different crops. Between 1976-81 and 2004-09, per capita production of foodgrains has not changed much; the average in 2004-09 is 206 kg. In the 3 years following 2008-09, however, per capita production of foodgrains has risen to 256 kg. The average of 206 kg in 2004-09 comprises 158 kg of Cereals and 48 kg of Pulses. Between 1976-81 and 2004-09, Wheat has increased from 76 to 105 kg per capita, while Coarse Cereals have declined from 65 to 32 kg. Among Pulses, Gram has increased from 26 to 36 kg per capita; Masur has also improved, but Moong-Moth, Tuar, etc., have declined drastically. Production of Oilseeds has increased from 13 to 89 kg per capita; it includes 73 kg of Soybean. Mustard-Rapeseed has increased from 2 to 11 kg per capita. Sesame has also improved; but per capita production of Groundnut and other oilseeds has declined.

Crop Maps up to this point depict district-wise area and production. Trends of growth and change have not been similar everywhere. There is great variation in the agriculture and cropping patterns of different districts and regions; the Maps in Section 6 to Section 11 are indeed intended to highlight such regional differences and specificities.

In the next section (Section 12), we give long-term state-level trends of growth. Agriculture in the state began to grow slowly from the early 1970s. The rates of growth began to rise from the early 1990s and this process continued uninterrupted up to the last years of the 20th century. Towards the turn of the century there was a sudden decline in the agriculture of the state; for a few years from around 1998-99 onwards, all parameters of agriculture kept declining. The situation began to improve from around 2003-04 and, during the following 8 or 9 years, there has been extraordinarily rapid growth. In the long-term trends given in this section, this period and especially the last 3 or 4 years of extremely rapid growth, look distinctly different than the earlier trends.

In the later part of this section, we give long-term trends of growth in net irrigated, net sown and gross cropped area separately for all 50 districts of the state. These trendlines indicate that all districts of the state have participated in the growth of the last five decades. The growth has set-in somewhat earlier in some districts and later in others; but the trendlines have run nearly parallel for all districts. And, no districts seems to have remained untouched by the rapid growth of the last 9 or 10 years.

In the last section, all data used in this Atlas has been compiled in detailed statistical tables.

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Alexander Walker, a British officer of the early 19th century, surveyed agriculture in different parts of India. He observed that people everywhere took keen interest in agriculture. They carefully and diligently tended to their fields to make them look like well-kempt gardens; and, they revelled in talking about agriculture. In the context of Malabar, he writes, "In Malabar the knowledge of Husbandry [agriculture] seems as ancient as their History. It is the favourite employment of the inhabitants. It is endeared to them by their mode of life, … It is a theme of their writers; it is a subject in which they delight to converse, and with which all ranks profess to be acquainted. …"

Agriculture indeed had that kind of prominence in the lives of the people of India. For them, the measure of the education and wisdom of a person was in the depth and extent of his knowledge of agriculture. In the rural areas of India even today people are proud of acquiring knowledge about the soils, the animals, the weeding, manuring and watering practices, the crops and cropping patterns, the seeds and agronomical practices, etc. Those who have such knowledge of their localities and of far-off places are respected and honoured in the rural communities.

In our education today, we hardly talk about these things. In this Atlas, we have tried to take agriculture seriously, and present a detailed picture of the land, soil, rivers and streams, animals and crops of the districts of Madhya Pradesh. For us, this effort shall be fully rewarded, if it leads to a renewed interest in agriculture amongst the educated people of the state.

I am thankful to the Madhya Pradesh Council of Science and Technology for giving me the opportunity to create this Atlas. My young colleagues Ashwani Chauhan and Nitin Gupta have contributed immensely in this work.

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