
Changing Pattern of Cropping in Maharashtra : A Study at a Glance

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Abstract:

Agriculture has a vital place in Indian economy and is one of the main sources of national income. About 56 per cent population is directly and indirectly engaged in agricultural. Land use pattern indicates how efficiently the land use resources available to the farmers were utilized. The land utilization pattern also indicates the area available for the cultivation, gross cropped area and cropping intensity. The main aim of the present paper is to identify the changes of agricultural land use pattern in Maharashtra State during fifty year periods from 1960-61 to 2021-22. The present study is based on the secondary source of data. The district has been taken as a unit for analysis the pattern of cropping intensity in the study area. During the span of fifty years periods, the cropping pattern in Maharashtra is changed on large scale. During this period the area under cereals crops is decreased by 19.07 % and other hand during same period's area under cash crops (7.73 %) and oilseeds (6.1 %) is increased. It means area under traditional crops is replaced by commercial crops. Main cause for changing in cropping pattern is development of irrigation facilities therefore area under irrigation is increased by 9.6 % during same periods. When single crop is considered, it is found that area under jowar (17.13 %) is maximum decreased during study period and other hand area under soybeans increased (12.61 %) during same periods

Keywords: Cropping pattern, Environmental change, Food grain, Soil, Pesticide

Introduction:

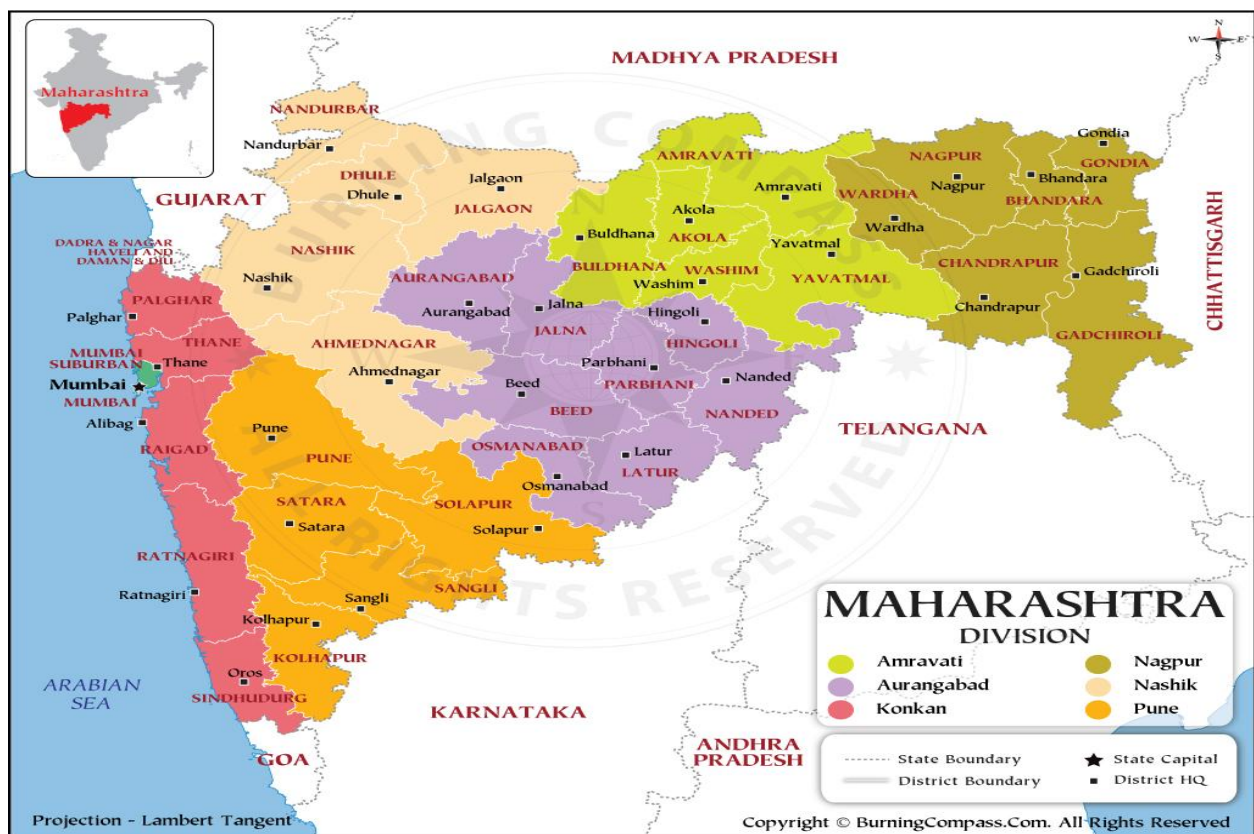
Cropping pattern according to some agricultural economist means, the proportion of the area under various crops at a point in time as indicated by cropping intensity in percentage. Kanwar (1971) define cropping pattern as the time and space sequence of crops. Earlier cropping pattern of a region was mainly determined by the agro-climatic factors i.e., only those crops were grown in a region which was suitable to the climate and are known as traditional crops. Now, farmers are influenced by changes in economic, technological, and institutional and policy induced factors (Gulati and Kelly, 1999). From the beginning of widespread agriculture until the 1960s when Green Revolution was not applied in Indian agriculture, wheat, rice, pulses, coarse cereals and small millets accounted for most of the cropland in India. Since then, there has been a widespread change in cropping pattern in the region. In India during pre-independence or pre-green revolution period, self sufficiency in food grains has been the top priority of our policies, due to the challenges of feeding our vast population (Hazra, 2013). The signs of imbalance in cropping pattern started to come into view right from the early post Green Revolution. Technological changes brought by the green revolution caused significant shifts in land utilization, in favour of crops like fine cereals (wheat and rice) on the cost of area under coarse cereals, pulses and small millets (Chakravarti, 1973). There are number of factors which were responsible for this shift in the cropping pattern along with differential rates of technological change among crops, irrigation bias of new technology, causing shift of land away from dry crops in favour of irrigated crops and the associated policy of price support system as well as market intervention by the government in certain crops but not in other crops and changing relative price between different crops (Dantwala, 1986). The study of cropping pattern represents a significant aspect within the spatial dimension of agricultural geography as it provides a good base for regional planning (Mohammad, 1985 and Shafi 2006).

Study Area:

Maharashtra is a state, which is located in the western region of India. Maharashtra State came into existence on 1st May, 1960. It extends between 15° 33'46'' N to 22° 02'13'' N latitudes and 72° 38'45'' E to 80° 53'17'' E Longitudes. It is India's second-most populous state and third-largest state by area. Maharashtra state known to be progressive state of India. Its geographical area is 3.08 lakh Sq.k.m. Maharashtra state has a long coastline stretching nearly 720 km along the Arabian Sea. It is bordered by the Arabian Sea to the west and the Indian states of Karnataka, Telangana, Goa, Gujarat, Chhattisgarh, Madhya Pradesh and the Union territory of Dadra and Nagar Haveli

The Maharashtra State divided into three major physiographic divisions namely the Western Ghats (Sahyadri), The Deccan Plateau and the coastal lowland of Konkan. Godavari, Krishna, Tapi and Pirna are major the rivers of Maharashtra state. Maharashtra has typical monsoon climate, with hot, rainy and cold weather seasons. However, dew, frost and hail also occur sometimes, depending upon the seasonal weather .The hot scorching summer from March

onwards is followed by monsoon in early June. The state receives rainfall from the southwest monsoon winds during the periods from June to September. In 2012 the recorded thick forest area in the state was about 20.13 % of the state's geographical area. Agriculture is major occupation in rural areas of Maharashtra state. Location of the study area is showed in Map No.1. Maharashtra state consists of six administrative divisions, namely Amravati, Aurangabad, Konkan, Nagpur, Nashik and Pune. The state's six divisions are further divided into 36 districts, 109 sub-divisions and 357 talukas. Maharashtra is divided into five geographic regions. It includes. Khandesh , Desh, Marathwada Vidarbha and Konkan. Maharashtra is the second largest state in India in terms of population. It has a population of 11.24 crore (Census 2011) which is 9.3 % of the total population of India and is highly urbanized with 45.2 % people residing in urban areas. Maharashtra has a life expectancy at birth of 67.2 years in 2011. Maharashtra has 24 universities with a turnout of 160,000 Graduates every year. Its GDP per capita crossed the Rs 1.20 lakh, threshold for the first time in 2013, making it one of the richest states in India.



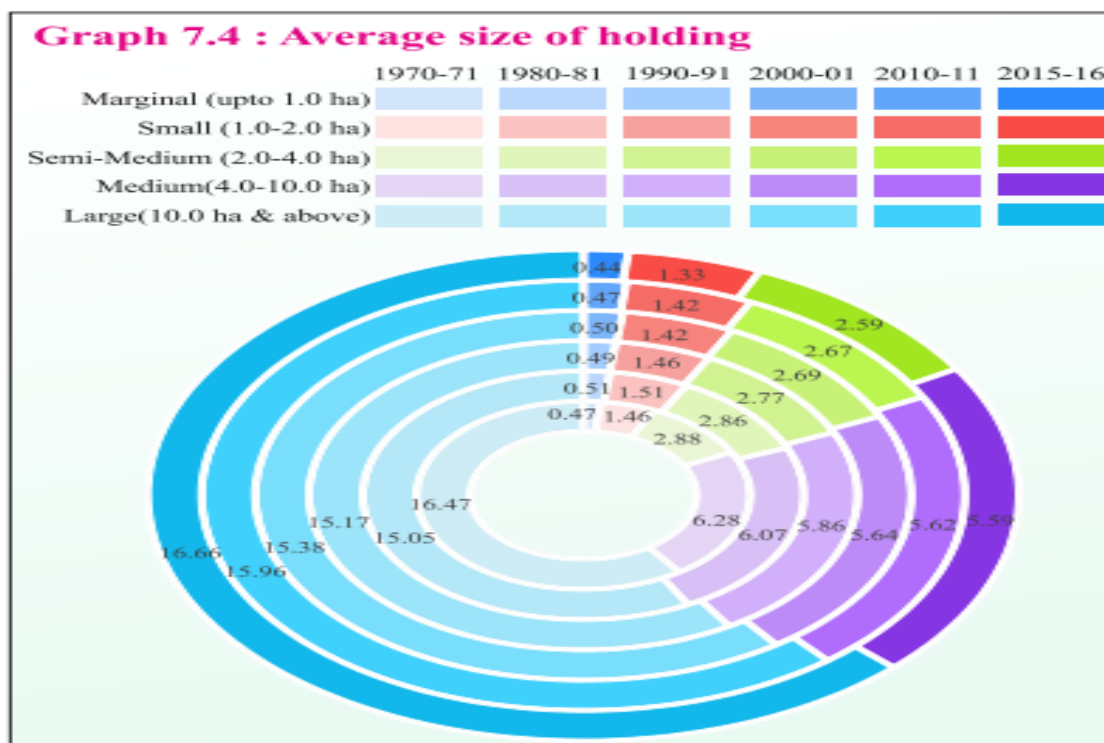
Conceptual framework:

The above discussions indicate that agriculture is sensitive to weather fluctuations, and climate related risks significantly impact production and allocation of land in agriculture (Lobell and Field, 2007; Tao et al., 2008). In addition, the lack of information about climatic and other factors make traditional farming risky, and hence small and marginal farmers of developing countries like India vulnerable. In this critical scenario, the climate scientists

suggest adapting systemic transformation of agricultural practices, particularly in respect of cropping patterns and crop diversification. The harmful consequences of climate change can be reduced by combining advances in agricultural science, meteorology and information technology with traditional adaptation strategies by the farmers through appropriate interventions. In India, since initiation of the Green Revolution, government policies have supported advancement in crop productivity mainly through use of chemical fertilizers, high yielding varieties (HYV) seeds and irrigation. In general, such initiatives have also aimed at reducing farmers' dependence on climate. Farmers also adjust to production risks in various ways based on their risk aversion strategies, weather knowledge and resource availability. For example, farmers who foresee a shock typically use ex-ante risk management measures to save, diversify, and pick a less hazardous crop mix to achieve a steady income. There has been extensive research on the impact of farmers' access to various infrastructure facilities on various agricultural and rural development indices. These indicators have included, among others, technology adoption, crop selections, farm performance, income and employment, land values, and rural poverty. In addition, there are several scientific studies on climate change, its effects on farming practices and appropriate adaptation strategies along with the role of policies and institutions. This paper attempts to examine the role of technological, ecological and infrastructural factors in promoting transition toward non-food grains in the line of these aspects. Accordingly, the following conceptual framework is envisaged (Fig. 1). The basic notion of this framework is based on the insights from the literature, research gaps thus identified, and the experienced gathered from the case study carried out in the ongoing study 'Promoting Socially Inclusive and Sustainable Agricultural Intensification in Maharashtra (India), India.² The extreme weather events like heavy rainfall, cyclones, floods and droughts are common in this region. Farmers of the study area, often experience low agricultural yields primarily due to adverse climatic conditions. Fragmented landholding and low scale of farming limit the scope of application of modern farming practices to improve yield. Besides, unreliable access to electricity for groundwater extraction and water shortage in both Autumn and Spring season create hindrance for the application of appropriate fertilizer to improve productivity (Reddy, 2017).

Operational holdings:

The number of operational holdings were 0.50 crore during the first Agriculture Census (1970-71) which increased to 1.53 crore during the tenth Agriculture Census (2015-16). Area of operational holdings decreased from 2.12 crore ha in Agriculture Census 1970-71 to 2.05 crore ha during Agriculture Census 2015-16. The average size of holding decreased from 4.28 ha (Agriculture Census 1970-71) to 1.34 ha during Agriculture Census 2015-16. 7.6.1 As per Census 2015-16, average size of land holding for SC and ST was 1.24 ha and 1.76 ha respectively. The share of female operational holders was 14.1 per cent with 1.22 ha of average size of land holding. The time series data on operational holdings in the State is given in Annexure 7.1. Operational holdings and area of operational holdings in the State are given in and operational holding area and average size of holdings in selected states.



Land utilization :

The land utilisation statistics for 2019-20 depicts that of the total 307.58 lakh ha geographical area of the State, gross cropped area was 235.70 lakh ha while net sown area was 167.22 lakh ha (about 54.4 per cent). The time series data of land utilisation is given in Annexure 7.2. Agricultural Production 7.9.1 Kharif crops: During kharif season of 2021-22, the sowing was completed on 155.15 lakh ha, as against 159.48 lakh ha during previous year in the State. The area under pulses, oilseeds and sugarcane is expected to increase while area under cereals and cotton is expected to decrease as compared to the previous year.

Agricultural Production:

Kharif crops: During kharif season of 2021-22, the sowing was completed on 155.15 lakh ha, as against 159.48 lakh ha during previous year in the State. The area under pulses, oilseeds and sugarcane is expected to increase while area under cereals and cotton is expected to decrease as compared to the previous year

Table 7.5 Area and production of principal *kharif* crops

Crop	Area ('000 ha)			Production ('000 MT)		
	2020-21	2021-22 (tentative)	Per cent change ^a	2020-21	2021-22 (tentative)	Per cent change ^a
Rice	1,473	1,549	5	3,027	3,237	7
Jowar	379	209	(-)45	381	173	(-)55
Bajra	687	504	(-)27	906	458	(-)49
Ragi	82	73	(-)10	94	94	(-)0.4
Maize	810	873	8	2,625	2,330	(-)11
Other Cereals	37	44	18	17	17	(-)1
Total Cereals	3,467	3,253	(-)6	7,050	6,308	(-)11
Tur	1,340	1,335	(-)0.3	1,450	963	(-)34
Moong	401	377	(-)6	207	183	(-)12
Udid	356	436	22	227	235	4
Other Pulses	123	79	(-)36	90	68	(-)24
Total Pulses	2,220	2,226	0.3	1,974	1,448	(-)27
Total Foodgrains	5,688	5,480	(-)4	9,024	7,756	(-)14
Soyabean	4,290	4,617	8	6,264	5,422	(-)13
Groundnut	226	203	(-)10	271	240	(-)11
Sesamum	19	8	(-)61	5	2	(-)68
Nigerseed	8	6	(-)26	2	1	(-)30
Sunflower	19	12	(-)35	9	6	(-)31
Other Oilseeds	10	3	(-)72	4	1	(-)79
Total Oilseeds	4,573	4,849	6	6,554	5,672	(-)13
Cotton (Lint) ^(b)	4,545	3,954	(-)13	10,110	7,112	(-)30
Sugarcane ^{**}	1,143	1,232	8	1,11,642	1,11,200	(-)0.4
Total	15,948	15,515	(-)3	-	-	-

(a) Production of cotton in '000 bales of 170 kg each ** Harvested area # Calculated on the basis of actual figures

Note: Figures for 2020-21 are based on final estimates & for 2021-22 are based on second advance estimates

Figures may not add up due to rounding

Source : Commissionerate of Agriculture, GoM

Rabi crops:

During rabi season of 2021-22, by the end of January sowing was completed on 52.47 lakh ha which is 10 per cent less than the corresponding period of previous year. The area of pulses is expected to increase whereas area of cereals and oilseeds crops is expected to decrease as compared to previous year

Table 7.6 Area and production of principal *rabi* crops

Crop	Area ('000 ha)			Production ('000 MT)		
	2020-21	2021-22 (tentative)	Per cent change [#]	2020-21	2021-22 (tentative)	Per cent change [#]
Jowar	1,942	1,351	(-30)	1,805	1,362	(-25)
Wheat	1,126	935	(-17)	2,071	1,662	(-20)
Maize	332	275	(-17)	868	725	(-16)
Other cereals	14	11	(-22)	5	4	(-17)
Total cereals	3,414	2,572	(-25)	4,749	3,753	(-21)
Gram	2,231	2,525	13	2,397	2,757	15
Other pulses	124	105	(-15)	67	46	(-31)
Total pulses	2,355	2,630	12	2,464	2,803	14
Total foodgrains	5,769	5,202	(-10)	7,214	6,556	(-9)
Sesamum	2	1	(-15)	0.5	0.5	(-6)
Safflower	21	19	(-9)	12	11	(-11)
Sunflower	4	7	88	2	3	59
Linseed	7	6	(-14)	2	2	(-29)
Rapeseed & mustard	15	12	(-21)	5	4	(-15)
Total oilseeds	48	45	(-6)	21	20	(-7)
Total	5,817	5,247	(-10)	-	-	-

Calculated on the basis of actual figures

Note : Figures for 2020-21 are based on final estimates and for 2021-22 are based on second advance estimates

Figures may not add up due to rounding

Source : Commissionerate of Agriculture, GoM

Conclusion:

The results show that, there was declining trend of area under food crops. Out of all non-food crops, sugarcane and soybean recorded higher growth rate in area under cultivation. Cropping intensity was found very high in Jalgaon, Kolhapur, Aurangabad, Jalna, Parbhani, Hingoli, Osmanabad, Latur, Buldhana, Akola, Washim and Bhandara districts of Maharashtra. Whereas very low cropping intensity. The very low cropping intensity was found in Thane and Ratnagiri districts of the study region

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