# ASSESSMENT OF AGRICULTURAL DEVELOPMENT IN VIEW OF CHANGING PATTERNS OF MANSON

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## 1. Introduction:

It is said that "Nature not belong to Man but Man belongs to the Nature". In earlier days there was dominance of Nature on Man but because of the technological innovation and advancement, Man is trying to dominate on Nature. It is a source of livelihood for all human being. From human history all we know that, human started first occupation on Earth is agriculture, which is today also source of survival for many people and specifically poor in the world. If there is some change happens in the Nature like climate change then there will more effect on all activities, which human being directly or indirectly related. There is close relationship between nature and agriculture. All agriculture activities are depend upon nature only. Present study is focused on impact of climate change on agriculture development in Maharashtra. In terms of population and geographical area, Maharashtra is the second largest state in India. The share of agriculture and allied activities in net state domestic product (SDP) for Maharashtra declined from around 38 per cent in 1961-62 to 22.9 per cent in 1992-93 and 12.8 per cent in 2010-11. The corresponding numbers for all India were 50.9 per cent and 32.3 per cent and 14.2 per cent respectively. Thus, the contribution of agriculture to the net SDP has been less in Maharashtra as compared to the national average.

It may however be noted that Maharashtra's economy is predominantly agrarian since around 60 per cent in of the total workers were dependent on agriculture and allied activities for their livelihoods in the early 1990s. Secondly, in terms of employment generation agriculture sector is contributing 56.30 per cent in 2004-05 and remaining two sector i.e. industry and service sector contribute 10.60 per cent and 33.10 per cent respectively in the same year. That means, agriculture sector contribute more than half in employment generation of Maharashtra economy. This share of workforce should decline as economy progress but this is not happen in the economy. From above all facts, agriculture sector play important role in the development of Maharashtra economy. In this paper, we tried to analyze the impact of climate change on the agriculture in Maharashtra.

## 2. Objective:

The objectives of this paper are

i) To assess the changes in land utilization pattern in Maharashtra,
ii) To identify changes in cropping pattern in Maharashtra.

## 3. Methodology and Data:

This study is mainly focused on secondary data. The time series data on land utilization and area under various crops were collected from the published sources like Season and Crop Report published by Commissioner (Agriculture), Department of Agriculture, Pune and Economic Survey of Maharashtra published by Government of Maharashtra. For data analysis we have used percentages, compound annual growth rate (CAGR) and other statistical tools. This time series data has been classified into two periods i.e. Period-I (1991-92 to 2000-01) and Period-II (2001-02 to 2010-11) for land utilization and for cropping pattern data has been classified into two different periods i.e. Period-I (1988-89 to 1997-98) and Period-II (1998-99 to 2007-08) due to unavailability of data.

## 4. Scope and Limitations:

This study is restricted only to Maharashtra agriculture sector development. In that we have considered only two variable i.e. land utilization and cropping pattern. So, all the results applicable to only above mention limitations.

## 5. Findings and Discussions:

### 5.1. Changes in Land Utilization:

The land utilization pattern displayed minimal changes over the entire period from 1991-92 to 2010-11. The net sown area which was 58 per cent of geographical area in 1991-92 declined to 56.57 per cent in 2010-11. While gross cropped area (GCA) increased by 13 per cent over the entire period, the net sown area (NSA) declined by 3 per cent. The cropping intensity (GCA/NSA*100) which was 112 percent in 1991-92 increased to 133 per cent in 2010-11. The fallow land increased by 5 per cent during the entire period while current fallow showed decline of 4 per cent over the entire period. Land under forest increased by 2 per cent while that for permanent pastures and grazing increased by 8 per cent.

The compound annual growth rate (CAGR) is shown in the table 1, land utilization under forest increased in 1991-92 to 2000-01 by 0.37 per cent but this rate declined near up to zero per cent in 2001-02 to 2010-11. This change will create negative impact on future of rainfall in Maharashtra.

**Table 1: Compound Annual Growth Rate of Land Utilization Statistics of Maharashtra**

| Sr. No. | Particulars | Period-I (1991-92 to 2000-01) | Period-II (2001-02 to 2010-11) |
|---|---|---|---|
| 1 | Forest | 0.37 | 0.00 |
| 2 | Not available for cultivation | 0.40 | 0.06 |
| 3 | Permanent Pastures and other Grazing Land | 1.84 | -0.06 |
| 4 | Land under Misc. Tree Crops & Grooves | -2.49 | 0.21 |
| 5 | Cultivable Waste land | -0.75 | 0.06 |
| 6 | Fallow land Other than Current Fallows | 0.35 | -0.12 |
| 7 | Current Fallow | -1.92 | 1.30 |
| 8 | Net Area Sown | -0.16 | -0.14 |
| 9 | Area sown more than once | 8.38 | 2.13 |
| 10 | Gross Cropped Area | 1.12 | 0.38 |

**Source: Economic Survey, Government of Maharashtra (various issues).**

In the Period-I, area under gross cropped area and area sown more than once were showed positive changes but in Period-II all parameters are on deteriorating except than area under current fallow land. The area sown more than once shows impressive CAGR by 8.38 per cent in Period-I but drastically declined in Period-II, which CAGR is only 2.13 per cent (Table 1). The land not available for cultivation and fallow land other than current fallows are on decline rate in Period-II, which is good indication but current fallow CAGR was 1.30 per cent in the same period which was -1.92 per cent in Period-I and this is not encouraging indication. This is may be because of uncertainty in the rainfall receive by the State in last two decades.

The net area sown is continually on declining; in Period-I it was -0.16 per cent and in the Period-II it was -0.14 per cent. Overall, area sown more than once and gross cropped area were declined and current fallow land is increased, which is not encouraging indication.

### 5.2. Changes in Cropping Pattern:

The cropping pattern (Table 2) in Maharashtra reveals that agriculture in Maharashtra continues to be dominated by food grains. However, the important point to note is that food grains which constituted 66.85 percent of GCA in 1988-89 showed a gradual decline and constituted 58.19 per cent of the gross cropped area in 2007-08. Among food grains, the decline was with respect to cereals and the area under jowar, the main cereal in Maharashtra which constituted 29 per cent of GCA in 1988-89 declined to 18

per cent in 2007-08. The notable feature of Maharashtra's agriculture is that the cropping pattern is shifting towards commercial crops. The share of oilseeds in GCA increased from 12.92 per cent in 1988-89 to 17 per cent in 2007-08. The Technology Mission on oilseeds launched in 1986 coupled with price support encouraged the shift in area towards oilseeds.

**Table 2: Area under crops in Maharashtra (Percentage)**

| Year | Rice | Wheat | Total Jawar | Bajari | Total Cereals | Total Pluses | Total Food grains | Total Sugar-cane | Cotton | Soya-bean | Gr d-nut | Total oil seeds |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1988-89 | 7.24 | 4.07 | 28.77 | 9.16 | 51.46 | 15.39 | 66.85 | 1.81 | 12.23 | 0.40 | 4.27 | 12.92 |
| 1989-90 | 7.12 | 3.92 | 29.57 | 8.86 | 51.53 | 15.32 | 66.85 | 2.02 | 12.12 | 0.58 | 3.95 | 12.36 |
| 1990-91 | 7.31 | 3.96 | 28.82 | 8.88 | 50.94 | 14.90 | 65.84 | 2.45 | 12.45 | 0.92 | 3.95 | 13.04 |
| 1991-92 | 7.82 | 3.20 | 27.16 | 9.43 | 49.62 | 15.30 | 64.92 | 2.92 | 13.70 | 1.29 | 3.67 | 11.29 |
| 1992-93 | 7.41 | 3.23 | 27.94 | 9.11 | 50.01 | 15.98 | 65.99 | 2.54 | 12.15 | 1.69 | 3.11 | 12.15 |
| 1993-94 | 7.37 | 3.54 | 28.72 | 8.35 | 50.17 | 16.11 | 66.27 | 2.04 | 11.59 | 2.31 | 3.09 | 13.28 |
| 1994-95 | 7.28 | 3.75 | 25.62 | 8.33 | 47.19 | 16.86 | 64.05 | 2.98 | 12.98 | 2.66 | 2.88 | 12.79 |
| 1995-96 | 7.22 | 3.58 | 26.31 | 8.06 | 47.06 | 15.63 | 62.69 | 3.06 | 14.31 | 2.87 | 2.74 | 12.51 |
| 1996-97 | 6.98 | 3.75 | 25.75 | 9.09 | 47.67 | 15.40 | 63.07 | 2.88 | 14.33 | 2.97 | 2.65 | 12.02 |
| 1997-98 | 6.79 | 3.44 | 25.30 | 7.69 | 45.57 | 15.03 | 60.60 | 1.95 | 14.44 | 3.94 | 1.92 | 11.98 |
| 1998-99 | 6.69 | 4.58 | 21.55 | 7.94 | 43.35 | 15.83 | 59.18 | 2.30 | 14.44 | 4.76 | 1.84 | 12.18 |
| 1999-00 | 6.83 | 4.58 | 21.15 | 7.67 | 42.76 | 15.93 | 58.69 | 2.65 | 14.26 | 4.67 | 2.39 | 11.84 |
| 2000-01 | 6.79 | 3.39 | 22.89 | 8.09 | 44.14 | 15.98 | 60.13 | 2.67 | 13.83 | 5.13 | 2.20 | 11.50 |
| 2001-02 | 6.76 | 3.46 | 22.93 | 6.25 | 42.00 | 15.12 | 57.12 | 2.58 | 13.86 | 4.93 | 1.92 | 10.53 |
| 2002-03 | 6.80 | 2.97 | 21.46 | 6.91 | 41.23 | 15.84 | 57.08 | 2.56 | 12.51 | 5.61 | 1.87 | 11.11 |
| 2003-04 | 4.97 | 2.47 | 14.44 | 4.31 | 27.83 | 11.17 | 39.01 | 1.44 | 8.98 | 5.17 | 1.23 | 8.98 |
| 2004-05 | 6.46 | 3.23 | 20.35 | 6.54 | 39.41 | 14.49 | 53.47 | 1.40 | 12.15 | 9.00 | 1.78 | 14.23 |
| 2005-06 | 6.72 | 4.14 | 20.47 | 6.36 | 41.24 | 15.22 | 56.46 | 2.2 | 12.75 | 10.41 | 1.96 | 16.23 |
| 2006-07 | 6.78 | 5.45 | 20.47 | 6.44 | 42.62 | 16.97 | 59.60 | 3.76 | 13.77 | 11.18 | 1.99 | 17.12 |
| 2007-08 | 6.96 | 5.53 | 18.31 | 5.66 | 40.28 | 17.90 | 58.19 | 4.82 | 14.10 | 11.75 | 1.85 | 16.95 |

Source: Economic Survey, Government of Maharashtra (various issues).

Further, it was the non-traditional oilseeds such as soyabean which began to gain importance and the share of soyabean in total oilseeds which was only 3 per cent in 1988-89 increased to 65 per cent in 2007-08. In contrast, conventional oilseeds witnessed a fall in area and its share in total oilseeds declined from 30 per cent in 1988-89 to 11 per cent in 2007-08 (Table 2).

From Table 3, we can observed that, area under wheat, total pluses, sugarcane, soyabean and total oil seeds are increased which are commercial crops. Thus, there is a clear transformation in cropping pattern from traditional crops like total cereals to commercial crops like total oilseeds over the last twenty years, which could be recognized to various reasons like:

a. Replacement of low-value cereal crops like Jawar and Bajara with high-value crops like Sugarcane and Soyabean,

**Table 3: Compound Annual Growth Rate of Area under crops in Maharashtra**

| Sr. No. | Year | Period-I (1988-89 to 1997-98) | Period-II (1998-99 to 2007-08) |
|---|---|---|---|
| 1 | Rice | -0.57 | 0.68 |
| 2 | Wheat | -1.74 | 2.35 |
| 3 | Total Jawar | -1.29 | -1.55 |
| 4 | Bajari | -1.80 | -3.45 |
| 5 | Total Cereals | -1.21 | -0.57 |
| 6 | Total Pluses | -0.14 | 1.63 |
| 7 | Total Food grains | -0.96 | 0.06 |
| 8 | Total Sugarcane | 0.99 | 8.85 |
| 9 | Cotton | 1.99 | -0.01 |
| 10 | Soyabean | 29.26 | 10.84 |
| 11 | Groundnut | -8.37 | 0.30 |
| 12 | Total oil seeds | -0.71 | 4.00 |
| 13 | Gross cropped area | 0.13 | 0.25 |

Source: Table 2.

b. Introduction of Soyabean crop in Pluses based cropping system for minimizing uncertain rainfall risks,
c. Resorting to alternative cropping systems involving more drought tolerant crops to diminish crop losses on account of recurring condition of drought.

## b) Conclusion:

There is close relationship between nature and agriculture. All agriculture activities are depend upon nature only. Present study is focused on impact of climate change on agriculture development in Maharashtra. From above study we found following important conclusion:

*Firstly*, In the Period-I, area under gross cropped area and area sown more than once were exhibited positive changes but in Period-II all parameters are on deteriorating except than area under current fallow land. *Secondly*, The land not available for cultivation and fallow land other than current fallows are on decline rate in Period-II, which is good indication but current fallow CAGR was 1.30 per cent in the same period which was -1.92 per cent in Period-I and this is not encouraging indication. This is may be because of uncertainty in the rainfall receive by the State in last two decades. *Thirdly*, there is a clear transformation in cropping pattern from traditional crops like total cereals to commercial crops like total oilseeds over the last twenty years.

Finally, we would like to give suggestion like a) there is need to intervention by the government to restore area under forest, which will improve rainfall condition in the State and improvement in the facility of supply of irrigation, b) there should be more encouragement to cultivate traditional crops which important for health of our people because it is the source of protein for vegetarian and more investment should allocate to research or innovate new variety of traditional crops which will gives more productivity.

## c) References:

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