Chapter 1

Introduction

1.1 Introduction

Agriculture is an important sector in India which contributes 17 percent of GDP and provides job to 57 percent of working population. This is mainly important source of raw material for agro-based industries. It is a market for engineering and consumer industries. In the most of developing countries, labor force dependent upon agriculture and allied sector as a source of livelihood has been declining in the last centuries of 1990, but in case of India, its importance as
a major source of employment has not yet come down. Agriculture sector is vital for foreign exchange earnings. India’s export is predominantly composed of agro-based commodities and materials. The pace of agricultural sector is fairly encouraging after liberalization and it is gradually gaining in strength. But the vital issues such as low productivity per hectare, low GDP growth rate of agricultural sector, declining size of public and private sector investment in agricultural sector, difficulties in marketing of produce, minimum and reasonable price to farmers, poor and slow infrastructure development, insufficient storage facilities, inadequate irrigation facilities are remained to resolve.

Maharashtra is one of the most industrialized and urbanized states in India. Paradoxically, it also enjoys the dubious distinction of a state having highest rural–urban disparity in standard of living of its population. Maharashtra state of Republic of India established in May 1, 1960. It has 3, 07,690 sq. km. geographical area. Maharashtra scattered from east to west 800 km; north to south 700 km. It has 720 km coastal line. Maharashtra is neighboring with Madhya Pradesh at east, Karnataka and Goa at south, Gujarat and Madhya Pradesh at north. Arabian Sea is at west. Summer temperature in Maharashtra’s is minimum 22 degree Celsius and maximum 42 degree Celsius. Some times in the May it went up to 46 degree Celsius. Its winter temperature is 12 degree Celsius to 34 degree Celsius. Its capital is Mumbai. Political and cultural capitals of Maharashtra are Nagpur and Pune respectively.

1.2 Justification of selecting topic as a special case of Maharashtra

In Maharashtra, almost all types of crops can be grown. In decades of 1970 and 1980, Maharashtra was leading state in crops like Rice and Pulses.
Later on Cash crops such as Sugarcane, Cotton, Grapes, Onion and Bananas, Orange became popular amongst the farmers. However, after the introduction of the New Economic policy, cropping pattern went in favour of cash crops. Hence, present study explores the changing pattern of crops in Maharashtra. It also investigates the forces responsible for change in the cropping pattern. Present study verifies the impact of new economic policy on the cropping pattern of Maharashtra if any. The following table shows the agricultural production of the specific crop in a specific state in the year 2013-14 in India. The following Table 1.1 Gives trends in Agricultural Production for the year 2013-14.

### Table 1.1 Agricultural Productions 2013-14

(Production in million ton, cotton in million bales)

<table>
<thead>
<tr>
<th>Group</th>
<th>Crop</th>
<th>Highest crop producing state</th>
<th>Production in that state</th>
<th>Production in India</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food grains</td>
<td>Rice</td>
<td>West Bengal</td>
<td>15.31</td>
<td>106.54</td>
</tr>
<tr>
<td></td>
<td>Wheat</td>
<td>Utter Pradesh</td>
<td>30.25</td>
<td>95.91</td>
</tr>
<tr>
<td></td>
<td>Corn</td>
<td>Andhra Pradesh</td>
<td>4.97</td>
<td>24.35</td>
</tr>
<tr>
<td></td>
<td>Course Cereals</td>
<td>Karnataka</td>
<td>6.72</td>
<td>43.05</td>
</tr>
<tr>
<td></td>
<td>Pulses</td>
<td>Madhya Pradesh</td>
<td>5.09</td>
<td>19.27</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>Uttar Pradesh</td>
<td><strong>50.05</strong></td>
<td><strong>264.77</strong></td>
</tr>
<tr>
<td>Oilseeds</td>
<td>Ground nut</td>
<td>Gujarat</td>
<td>4.92</td>
<td>9.67</td>
</tr>
<tr>
<td></td>
<td>Mustard</td>
<td>Rajasthan</td>
<td>3.83</td>
<td>7.96</td>
</tr>
<tr>
<td></td>
<td>Safflower</td>
<td>Madhya Pradesh</td>
<td>5.37</td>
<td>11.99</td>
</tr>
<tr>
<td></td>
<td>Sunflower</td>
<td>Karnataka</td>
<td>0.30</td>
<td>0.55</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>Gujarat</td>
<td><strong>6.84</strong></td>
<td><strong>32.88</strong></td>
</tr>
<tr>
<td>Cash crops</td>
<td>Sugarcane</td>
<td>Uttar Pradesh</td>
<td>135.16</td>
<td>350.02</td>
</tr>
<tr>
<td></td>
<td>Cotton</td>
<td>Gujarat</td>
<td>10.95</td>
<td>36.59</td>
</tr>
</tbody>
</table>

Source: Agricultural statistics- At Glance2014, pp.61, 62
Why Maharashtra is lagging behind? Why this state is not in first five highest producing states in a specific crop? So, this study and findings out solutions, cropping pattern of Maharashtra is the research area of this thesis. Generally, crops are being taken in the two seasons. Sometimes farmers take crops in the summer also but that percentage is very low. Kharif crops in Maharashtra are Bajara, Rice, Cotton, Black gram, Tur and Jowar. Rabi crops are: wheat, Jowar and chana. Raigad, Sindhudurg, Ratnagiri, Thane, Bhandara, Chandrapur, Pune, Satara, Nagar and Nashik districts are rice bowl of Maharashtra. Pune, Satara, Nagar are famous for Bajra. Solapur, Beed, Osmanabad, Latur, Nagar, Nashik, Jalgaon, Pune, Dhule Yavatmal, Bhandara are growing Jowar. Similarly, Nashik, Nagpur, Osmanabad, Akola, Ahmad nagar, Dhule, Jalgaon, Beed, Wardha, Aurangabad, Beed, Parbhani are producing wheat. The western belt of Maharashtra- Sangali, Kolhapur and Pune along with Ahamednagar is famous for sugarcane crops as well as Dhule, Jalgaon, Buldhana, Akola and Amravati are producing cotton (white silver) exclusively in Maharashtra. In the recent years, various fruits are being grown in the various districts of Maharashtra. It is second among the states in India in respects of horticulture. Maharashtra has six administrative divisions. They are as follows:

<table>
<thead>
<tr>
<th>Region</th>
<th>Districts falls in the Region</th>
</tr>
</thead>
<tbody>
<tr>
<td>Konkan</td>
<td>Mumbai, Thane, Ratnagiri, Sindhudurg and Alibag</td>
</tr>
<tr>
<td>Pune</td>
<td>Pune, Satara, Sangali, Satara, Kolhapur and Solapur</td>
</tr>
<tr>
<td>Nasik</td>
<td>Nashik, Ahamednagar, Dhule and Jalgaon</td>
</tr>
<tr>
<td>Aurangabad</td>
<td>Aurangabad, Jalna, Parbhani, Beed, Latur, Nanded, Osmanabad and Hingoli</td>
</tr>
<tr>
<td>Nagpur</td>
<td>Nagpur, Wardha, Bhandara, Chandrapur and Gadchiroli</td>
</tr>
<tr>
<td>Amravati</td>
<td>Amravati, Yavatmal, Akola, Washim and Buldhana</td>
</tr>
</tbody>
</table>

Source: GoM Diary Data
Maharashtra being an important producer of cotton, sugarcane, groundnut and quite a few horticulture crops, such a secondary linkages of agriculture assume added importance to its rural economy, more so now, in the context of new liberalized trade environment for farm products. That is why careful assessment of agriculture’s past performance and based on it. Future prospects of growth are needed. The present study undertakes this exercise, focusing on the comparison between the early phase from 1991-1992 to 2000-2001, the later phase from 2001-2012 of the new millennium.

1.3 Background of Study

During the past two decades, the agriculture sector of Maharashtra has undergone wide ranging changes in terms of ownership of land, cropping pattern, cultivation practices, productivity and intensity of cultivation. Unlike the other regions in India, the farm sector of Maharashtra is characterized by extreme diversity in its bio-physical resource base and agro-climatic endowments providing multiple opportunities for growing a variety of crops. In earlier periods, the choice of cropping pattern was guided by agronomic considerations and consumption needs of the farmers. But in the recent past mainly market forces determine the trends in cropping pattern. Changes in cropping pattern are also determined by technological, infrastructural and institutional environment.

1.4 Importance of Study

Food, clothing and shelter are basic necessities of life. Agricultural sector plays an important role in fulfilling them. Indian population has almost doubled during the past two decades. The breakup of the traditional joint family system
and partitioning of households has resulted into fragmentation holdings from one hand and rise in the demand for new dwelling units on the other hand. This results into reduction in average size of holding in India. Increasing need of foods and requirement of cash forced the farmers to change the cropping pattern. In order to construct new houses and also to raise the required financial resources for construction, old trees like Banyan, Mango, Neem, Peepul tree in their homesteads happened to be cut down. Open space is created for building new houses and out houses for cattle and animals. This fact also made the small piece of land.

Government allotted the wastelands and non-agricultural lands for dwellings to landless farmers and agricultural workers and weaker section of the society which people later reclaimed to habitable areas through efforts. Due to difference in fertility of land over a period of time, changes in cropping pattern may take place. Government acquired a private land for military purposes and for construction of railway track, displacing a large number of households mostly belonging to rural laborer by paying them meager amount by Government. The new settlements and setting up new colonies also altered the exiting crop pattern.

Forest and Gavthan had been the main source of supply of green manure and fodder for cattle in earlier in India. Destruction of forests and encroachment on Gavthan land vanish this major source away. Cultivators had then to depend more on internal sources of fodder supply. As the results of which, cost of cultivation went up. Increase in the cost of cultivation is said to be one of the reasons for the shift from one crop to another crops.
Some agricultural land is affected by the problem of water logging and salinity. When the prices of crops went high, these land areas are used although the yield is poor. A chain reaction thus ensured. Agricultural sector in Maharashtra witnessed technological changes after the new economic policy 1991 by way of increasing use of high yielding variety seeds, chemical fertilizers and pesticides. Not only this modernization package increased the yield by two to three times using traditional varieties along with High Yielding Varieties considerably but also non availability of organic manure affected the micro organisms and other life forms in the field and reduced the texture and quality of the soil. This ultimately affected on the productivity per hectare. It is therefore, several farmers switched off traditional crops and varieties.

In the traditional system, cultivation was done mainly for home consumption. Crops were used as exchange medium for many requirements of the household. But over the period, consumption pattern of the people changed with greater dependence on the use of purchased goods. Therefore the purpose of cultivation changed from household consumption to production for the market. Now days the cultivators choose those crops that yield higher cash income to them in the long- run. Younger generation do not want to work on their farm as own force. Hence new generation prefer less laborious work which also changed the cropping pattern as they prefer labor saving crops.

1.5 Objectives of Research

Keeping in mind the broad theme of the research, following objectives are crafted for completing the task of the research:
1. To understand the cropping pattern of Maharashtra state.

2. To examine the trends of growth in production of major crops over the period under study.

3. To investigate the possible causes responsible for differential performance in growth.

4. To study the trends in instability in crop output, analysis the sources of the study period.

5. To analyse the inter district disparity in output growth for 1991-2012.

6. To identify technological and non technological variables.

7. To comment on the prospects of growth

8. To explore emerging constraints on growth path of agricultural sector in Maharashtra

9. To give suggestions to policy makers.

1.6 Hypotheses

A variety of factors such as natural, technological, institutional, social and economic can be considered to explain the backwardness of agriculture in Maharashtra. Nature is bounteous and sometimes it gives erratically and often snatches with one hand, what it gives with the other. If monsoons are kind and fields look resplendent with white green saplings, hail storms lash then mercilessly or floods wash them away and we are fortunate enough to escape the wrath of all this, we are sure to be blessed by locusts and other pest epidemics. Technological factors include primitive equipment, lack of irrigational facilities and inadequate availabilities of fertilizers. Institutional factors imply uneconomical size of holdings and defective land tenure system. Social and
economic factors include ignorance and superstitious nature of the farmers and their vulnerability on financial issues. After careful consideration the following hypothesis have been selected:

1. The cropping pattern under different regions of study is not same.

2. There is increasing tendency of changing cropping pattern in Maharashtra.

1.7 Research Methodology

1.7.1 Data and Data Sources

It is observed that 84% of cultivable land is rain fed and mostly depends on the rains received through south-west monsoon (June-September) Maharashtra has 226.12 lakh hectares of land under cultivation where cereals, pulses and other major food grains are grown. The extreme weather conditions coupled with low quality of soil and large area under rain fed cropping poses challenges in improving agricultural productivity. So all the important crops such as cereals, pulses, oilseeds, and commercial crops are selected for the present study.

Minor pulses and oilseeds and other crops are not considered for lack of data on these crops. Thus, the study was limited to principal crops with the assumption that expelled crops do not influence the cropping pattern which in turn, would not change the important findings and conclusions of this study. The selection of crops for study is dictated by the availability of data. The selected crops for study are Kharif Jowar, Rabi Jowar, Bajra, cereals, Tur, gram, other pulses, total food grains, oilseeds, cotton and sugarcane. The time series data on area, production and
(productivity) yield of selected crops and input use irrigated area, fertilizer consumption and area under high yielding varieties are collected from the various complications of government. The present study was conducted for Maharashtra state in India for the period 1991-2012.

Crop wise aggregate data on area, output and yield of 32 crops for 36 major districts have been obtained from publication of Government of Maharashtra. Detail fact and figure relates to Area, Production and Productivity of the principle crops in Maharashtra state are obtained from the Economic Survey of Maharashtra. The data is divided into two phases starting from 1991-1992 to 2001-2002 and 2002-03 to 2012-13. This period has been selected to know the impact of economic reforms on cropping pattern of Maharashtra if any.

Present data is culled from report of Annual report of Ministry of Agriculture Government of Maharashtra and in hand data is collected from Directorate of Agriculture Maharashtra state Pune. This study is undertaken to understand the trends in the cropping pattern of Yavatmal district. For that, time series data of major crops were collected from the office of Directorate of Agriculture, Pune, Maharashtra and office of the Commissioner of Land Record for the period 1991-92 to 2010-11. To observe the trends in major crops and cropping patterns data period has been divided in to two periods namely 1991-2000 and 2001-2010.
1.7.2 Study Period

The entire study period was split into two sub periods to evaluate the impact of a new production technology on agricultural development and take stock of the results in relative contribution of various parameters to output growth throughout the period of time. The sub-periods mentioned are as follows: period I-1991-92 to 2000-01, period II – 2001-02 to 2011-12. This research design has longitudinal study approach. Selection of study period is relevant to objectives of the study.

1.7.3 Research Tools

In the present study, we used statistical and econometric tools for writing this thesis. Besides averages, compounded annual growth rate, average annual growth rate, standard deviation, coefficient of variation, log linear model, dummy variable log linear model, mean comparison test and t test have been used for analyzing data and testing the hypotheses in the various chapters. Determinant of cropping pattern are analyzed using Log linear model. Case study method is also adopted for a study of cropping pattern in the Yavatmal district.

1.7.4 Limitations of Study

Present study is focuses on changing trends in cropping pattern in Maharashtra for the periods before reforms and after economic reforms. For that we used an aggregate data of main categories of the crops. However, crop specific study has not been conducted except cotton and sugar cane. In the district level trends in cropping pattern, region wise two districts have
been covered for observing trends in cropping pattern for the period 2000 to 2013. We could not cover all the districts of Maharashtra for this exercise. Panel data techniques is an appropriate for observing trends in cropping pattern in the Maharashtra but we have not tried panel data techniques due to continuity in the data and data constraints.

1.8 Organization of Thesis

Present study is divided into seven chapters. Chapter one introduces the research theme. It focuses on importance of study, study period, data sources and methodology perused for analyzing data. Chapter two reviews the relevant literature. This exercise helps us in creating background of the study and finding of a research gap exists on this theme of the research. Chapter three reviews the state of agriculture in India with recent data. The efforts made by central government in revitalizing agriculture sector are reviewed.

Chapter four is on trends and determinants of cropping pattern in Maharashtra. In this chapter trends in cropping pattern of major categories of crops are analyzed for the pre and post reforms period. The determinants of cropping patterns are analyzed for knowing active role of agricultural inputs/factors. Chapter five focuses on region and districts wise trends in cropping pattern in Maharashtra for the period 2000-2013. These efforts enable us to know variation and instability in the cropping pattern district wise.

Chapter six is case study of Yavatmal district. In this chapter, trends in cropping pattern of different crops is observed for which mean comparison t test
is used for the pre reforms and post reforms period. Along with this dummy variable regression is used for change in the cropping pattern.

In the last chapter, thesis is concluded with conclusions and policy suggestions are forwarded for balanced cropping pattern in Maharashtra. This may add into the overall richness and standard of Maharashtra.
REFERENCES

1. GoM Diary Data