

ECONOMICS OF ONION CROP IN MAHARASHTRA STATE, INDIA: A CASE STUDY OF AHMADNAGAR DISTRICT

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ABSTRACT

Being agrarian country, around 53 per cent population of India is directly engaged in agriculture and related activities. India's agricultural practices have evolved after several changes namely, green revolution, white revolution, yellow revolution, etc. irrespective of these changes, contribution of agriculture in Indian economy show continuous decline nearing to 15% of GDP. Agriculture helps in supporting first 2 sustainability development goals (SDGs) given by UN general assembly in the year 2015 namely, zero poverty, No hunger (food security), etc. In the present study, authors try to identify and find out the effect of various physio-economic factors on Rabi onion crop grown in Ahmednagar district of Maharashtra State, India. The study involves primary and secondary data to find the cost-benefit analysis for 2018-2021. In addition, authors tried to correlate the various parameters affecting the monthly price fluctuations.

Keywords: SDG, physio-economic factors, cost benefit analysis

Introduction

Onion (*Allium Cepa*) is consumed by all levels of people, i.e. poor to rich and hence has importance in every kitchen among fresh vegetables. In addition, its unique taste and flavor adds its importance in wide range of cuisines, thus there is a steady increase in demand of onion all around the world (NIAM, 2013). India is second largest producer in the world after China as per NHRDF data. Onion is the second most important commercial crops of the India which is next to Potato. Maharashtra, major grower state of onion in India contributes above 25 per cent of the India's total production (NHRDF, 2018).

Although Onion is originally a temperate crop but it is also grown various climatic conditions such as tropical and subtropical climate. The country like India, the suitable climate for the growth of the onion is mainly prevailed in the states of Madhya Pradesh, Maharashtra, Karnataka and Tamil Nadu. In the State of Maharashtra, rabi onion crop is grown with moderate temperatures (16-25°C). The onion is grown in the areas where average annual rainfall is 600-800 mm.

The Kharif Onion transplanting takes place in July-August and harvested in the months from October to December. Late kharif Onion is transplanted during October- November and harvested between January to March. The Rabi Onion is transplanted during December-January and harvested between End March to

May (State Dept. of Horticulture and Agriculture).

It is observed from statistical records that area and production of Onion has increased exponentially in the last 4 decades (1974-2015) (source NHRDF). The area under the onion in Maharashtra state has increased above 400,000ha.

Objectives

The broad objectives of the present study are:

- 1) To examine the cost and returns structure of onion Rabi crop in Ahmednagar district of 2018-2021
- 2) To identify the factors influencing the onion production and pricing

Hypothesis of the study

The present study is carried out using following hypothesis:

- a. The various physio-economic factors are mainly responsible for the cultivation of Rabi onion crop.
- b. The cost-benefit analysis primarily depends on the various physical (climatic) parameters and inputs of onion crop.
- c. The monthly price fluctuation on onion is determined/ controlled by production.

Study Area

Maharashtra state is one of the biggest onion producer State of the country as the favorable climatic factors and the main cash crop in the rain fed areas of the state. This study tries to understand the economics of onion crop of the

state. In the state, Ahmednagar district is the major producer having maximum number of markets. Location of the Ahmednagar district is as follows: Latitude 18.2⁰ to 19.9⁰ North and Longitude 73.9⁰ to 75.5⁰ East with total

geographical area of 1741271 ha. Lasalgaon is the largest market in Maharashtra followed by Ahmednagar, Nevasa, Shirrampur, Sangamner, Akola, Rahuri, Nevasa, Parner, Pathardi, Shrigonda and Karjat in the study area.

LOCATION MAP AHMEDNAGAR DISTRICT

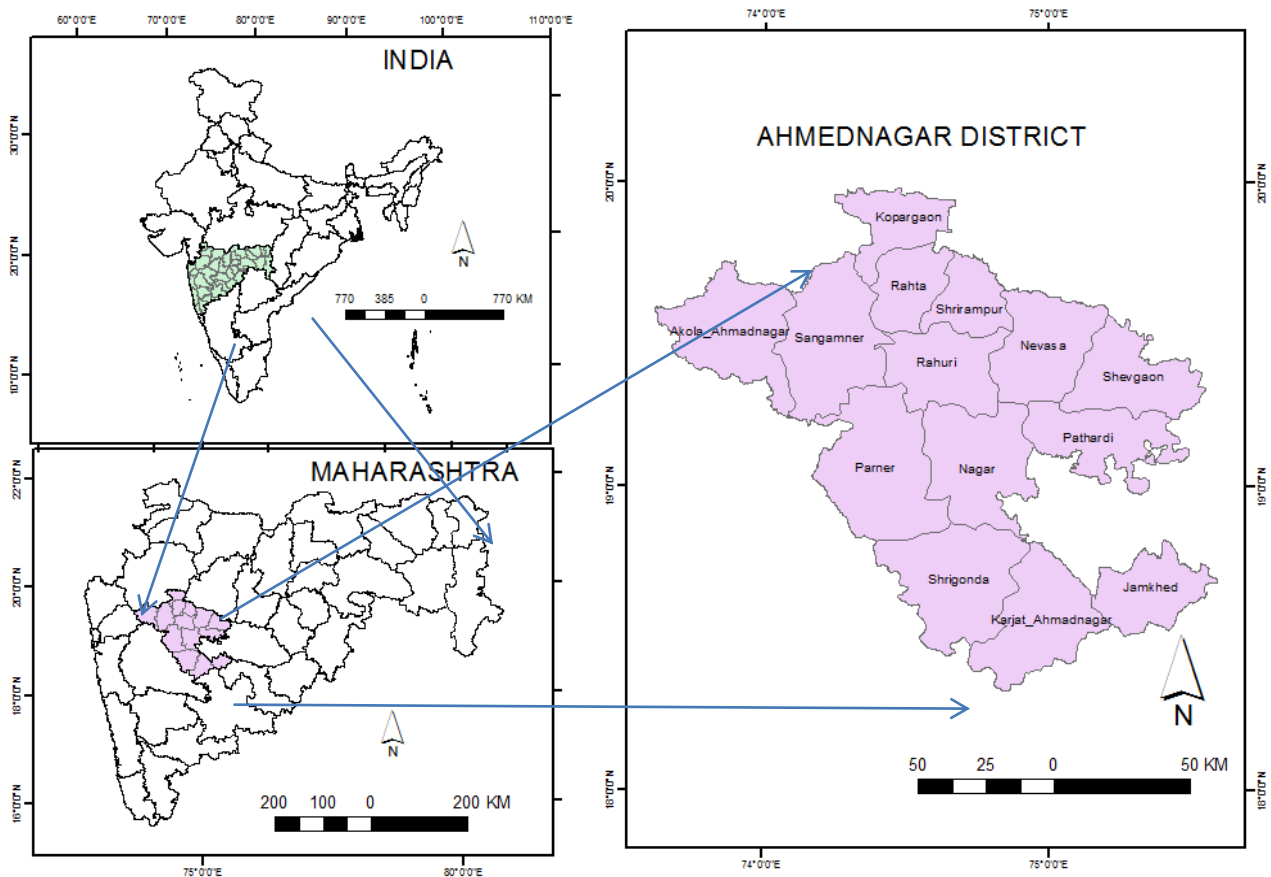


Figure 2: Location Map

Data and methodology

To understand the trend of the Onion in the state, the data was analyzed using various analytical techniques. They are listed as below:

a. The cost of production is expenditures incurred and returns received in the form of production of the crop. To analyse this, Cost Benefit Ratio (CBR) is the standard method to find the Incomes against the expenses for the production.

$$\text{CBR} = \frac{\text{Net Returns (Rs/Acre)}}{\text{Cost of Cultivation (Rs/Acre)}}$$

b. Correlation and descriptive statistics is used for finding relationship between various parameters with the production of onion.

c. Data collected from NHRDF for various market centers of Maharashtra state were collected and analyzed for finding the production and pricing relationship.

Results and discussion

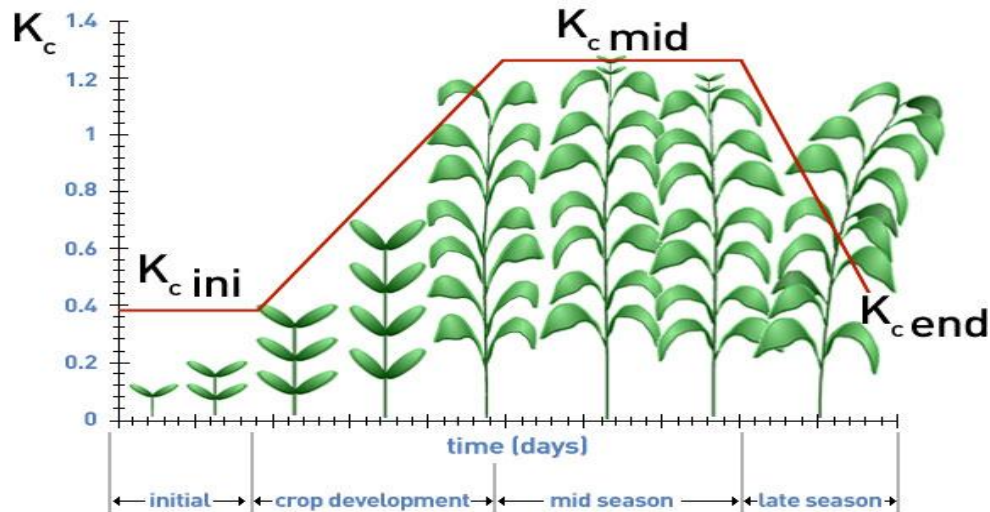
The production of onion crop is mainly dependent upon various physical factors like climate, soil, rainfall, evapo-transpiration, soil moisture capacity, etc. along with these, other factors like seed variety, raising seedlings, land preparation, transplanting, row spacing, irrigation, weed control, and plant protection. These factors have varying impact on the crop area and season differently. Hence good knowledge of these factors along with local conditions are to be utilized in a proper way results in higher productivity.

Factors influencing productivity of Onion

When climatic conditions are considered, mild weather in absence of excessive heat, cold and rains are suitable for onion crop. The optimum temperature should be lower from seedling to

vegetative growth stage i.e. around 1st two months. After flowering, the increase in temperature is favorable for the growth of the onion buds. Soils which have proper drainage

are most suitable for the crops, normally sandy loam to clay loam with 6.5 to 7 pH are the best type of soils have high onion productivity.



First, the seedlings are raised. For this, flatbeds or raised beds are most suitable to avoiding the water logging problem. 5 to 7 cm distance between spaced lines is considered ideal for sowing. For the preparation of land, proper leveling is required for the planting. The field is ploughed with an appropriate distance between two plough lines. In study area, farms are divided into small square patches and these square patches are known as “Wafa”. In these patches, zig-jag shaped type mud walls are made for smooth and slow water flow and these walls known as “Sari”.

transplanting of onion crop is 100% done by female workers. Next important parameter is the spacing. The size of the onion is mainly based on the spacing between two adjacent onion plants. For middle to small sized onion 10 to 12 cm spacing is proper to get maximum output.

Onion Production overall scenario of the State

Figure 1. Stages of Onion crop (Source: www.fao.org)

The production and time wise variation is compared for various markets in Maharashtra State. There are in total 35 markets which receive the onion from various parts of the state. The general trend can be observed by monthly variation of prices is that the prices goes down in the months of April and May and remain low by December and again increase in the next year.

Flatbeds are most favorable for transplanting. For kharif crops, being rainy season raised beds are suitable. Equal size healthy seedlings are better for transplanting. In the study area, the

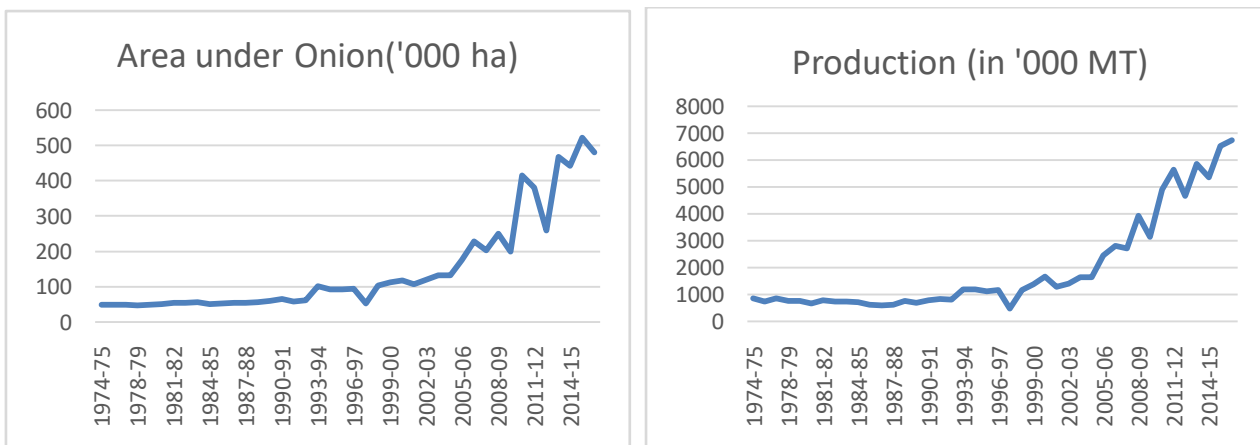


Figure 2. (a) Area, (b)Production of Onion of Maharashtra State (compiled by author)

It can be observed from figure 2 that, area and production of Onion has increased exponentially in the last 4 decades (1974-2015) (source NHRDF).

Trend of production and area of Maharashtra State over the span of 1974-75 to 2015-16 showed high increasing trend with 0.98 correlation and regression 0.97 with 0.001 level of confidence. Although the area has increased, yield shows slight decrease with time i.e. 16 ton/ha 1974-75 to 12-14 ton/ ha in 2014 which is not statistically significant.

Export of onion is also varying across the year. The trend of 2016 shows increase starting with lowest in April 142768 MT and highest peak in March 2017 i.e. 424084 M T of onion export. In contrast, the year 2017 has decreasing trend showing peak in the month of May and trough (decrease) during September to February.

Wholesale monthly prices of Onion varying across the year are of the major issue to all parts of the society from farmers to users. The major market centers are analyzed for the year 2016-19 and it was observed that there are two peaks where the modal prices were very high i.e. above Rs.2500/quintals.

Production and pricing relationship

For understanding the relationship with production and pricing, the monthly data from various markets is used and compared the temporal changes. Suresh and Mathur (2016) stated that in India, onion is one of the major crops having high production with increasing productivity during 2003-13. The trend for the year 2018 of all 40 market stations of Maharashtra shows a peak of pricing in the month of January followed by consistent decrease and steady prices with the range between 750 – 1500 Rs. per quintal. The prices for the major 13 market stations of Maharashtra state were studied (Annexure 1). Monthly modal market prices during January 2016 to October 2019 were compared with the market arrivals. The comparison showed inverse relationship. The trend showed that

when there is high arrival of onion in the market there is slight decrease in the prices. It can be clearly seen from graphs of various markets, that the prices are not only dependent on the quantity of arrival.

Prominent factors affecting the pricing of Onion

Pricing is dependent on climatic conditions and variation in rainfall is one of the deciding factor of inflation or decrease in the onion prices. As far as the 2016-18 conditions are considered, the rainfall has not been the main parameter affecting changes in the price. The excess rainfall affects the production of onion and respectively effects on the arrivals in the market producing more demand which leads to the increase in the prices. The same is observed in the early 2018 and in post monsoon months of 2019.

The excess unseasonal rains have destroyed the standing ready crops across various states on India. The scenario was observed in the whole onion belt of Maharashtra leading to decrease in the production and increase in the prices.

Benefit cost ratio

The costs and benefits are shown in the table shows at the price of Rs. 700/quintal shows the cast benefit ratio of 1: 2.09 (Table 3).

It can be observed from table 3 that the variable costs are fluctuating on the basis on the physical factors mainly climate and related parameters. For the year 2019 and 2020 comparatively favorable conditions were observed hence, Cost benefit ratio is higher, i.e. 2.07 and 2.16 respectively. In the year 2018, low cost benefit ratio (CBR =1.93) was achieved as a result of various factors dependent on physical parameters like below average climatic conditions and high cost of inputs namely, fertilizers, pesticides led to low production and low quality of crop which finally resulted in less profit per quintal production.

Table 3: Economical Elements of Onion crop for the year 2018-2021

Sr. No	Cost of onion production on the basis of its items	Total Production cost for 2018	Total Production cost for 2019	Total Production cost for 2020
		(in Rs per Acre)	(in Rs per Acre)	(in Rs per Acre)
A	Variable Cost	75932	77348	78138
1	Land Preparation	7000	7000	7000
2	Seeds	5000	5500	5800
3	Nursary Raising	4500	4800	5000
4	Manures	5800	5700	6000
5	Fertilizers	15000	16000	17500
6	Pesticides	2994	2000	2590
7	Irrigation	8000	7000	4000
8	Transplanting	3000	3500	3500
9	Weeding	2800	3200	3600
10	Harvesting	4700	5500	6000
11	Repairs and Maintainance	990	1000	1000
12	Interest on variable cost @ 10% for 6 months	3648	3648	3648
13	Cost of Transport with marketing	12500	12500	12500
B	Fixed Cost	6930	6930	6930
1	Depreciations	1050	1050	1050
2	Rental value of land	5500	5500	5500
3	land revenue	50	50	50
4	Interest on variable cost @ 10% for 6 months	330	330	330
C	Gross Cost of Onion Cultivation (C= A+B)	82862	84278	85068
D	Total Production of Onion from 1 acre (Quintal)	250	250	230
Di	Per Quintal Market Price	640	700	800
E	Gross Income from Onion	160000	175000	184000
F	Gross Return from Onion to the farmer per acre (E-C)	77138	90722	98932
G	Per quintal Production Cost (C/D)	331.448	337.112	369.861
H	Profit per Quintal (Di-G)	308.552	362.888	430.139
I	Benefit Cost Ratio	1.93092	2.07646	2.16298

Conclusions

Onion being one of the most important ingredients in the Indian cuisine, has tremendous demand in Indian market. In the present study, it was clearly observed that both physio-economic parameters are interrelated and directly affecting the cost and benefit of the onion crop. When one of these parameters is not favorable, farmers have to pay more leading to economic losses. The cost- benefit ratio showed that 2019 and 2021 were showing

comparatively higher ratio showing benefit to the farmers as compared to 2018 and 2020. The study tried to understand variation of price of onion. The temporal trends in various markets of Maharashtra state showed that economical factors along with physical parameters like increase in rainfall and off season rains are directly affecting the production and resulting in more demand than supply leading to the increase in prices of onion.

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Annexure 1: Major Onion Markets of Maharashtra

