



## Growth rates in area, production of potato in Meghalaya

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### ARTICLE INFO

#### Article history:

Received 18 June 2020

Revision 30 July 2020

Accepted 21 August 2020

#### Key words:

### ABSTRACT

The presented study is an attempt to study the trends of area and production of potato in Meghalaya. In order to study the trends of potato secondary for the period from 2005-06 to 2017-18. In the period 2005-06 to 2012-13 among all the districts of Meghalaya West Garo hills district shown highest positive growth in the area which was 4.60 per cent. Overall Meghalaya has recorded a negative growth rate but insignificantly. In the study period, 2013-14 to 2017-18 highest growth in the area was recorded in East Jaintia hills district (10.16%) and the highest production growth rate was observed in Ri-Bhoi district (8.88%).

### 1. Introduction

Potato is one of most cultivated and consumed vegetable in the world. Potato is consumed by more than one billion people in the world (FAO, 2008). India ranks third in area and second in production of potato in the world. By providing income generation opportunities as a cash crop and generating employment, potato contributes to alleviating poverty (Scott, Rosegrant, and Ringler 2000). Uttar Pradesh shares nearly 30 per cent of total production followed by West Bengal and Bihar like 25 per cent and 15 per cent respectively. Meghalaya shares 0.39 per cent of total production in India. North Eastern region contributing about 10 per cent of the area under potato in the country (Gupta *et al.*, 2004). The average potato consumption in India was 25.5 kg. The average potato consumption in Meghalaya was 80 kg per annum.

### 2. Methodology

This paper deals with materials and statistical methodologies to carry out the investigation undertaken. In order to study the trend and growth rate of area and production of Potato crop in Meghalaya. The time series data pertaining to the period from 2005-06 to 2012-13

and 2014-15 to 2017-18 on area, production and productivity of different crops have been used to study the growth trends. These time series data have been procured from the Directorate of Horticulture, Meghalaya.

Compound annual growth was calculated by using log–lin regression model

$$\text{Log } Y_t = \beta_1 + \beta_2 t + u_t$$

Where,

Y= dependent variable,

T=time,

$\beta_1$ = intercept,

$\beta_2$ =slope coefficient

$$\text{CAGR} = (\text{Exp } (\beta_2) - 1) * 100$$

### 3. Results and Discussion

#### *Trend analysis of Area and Production of potato in Meghalaya*

##### 3.1. Growth rate of Area of potato in Meghalaya (2005-06 to 2012-13)

The growth rate of area under potato was negative though not significant in the state and most of the growing district (Table 1). In the period of 2005-06 to 2012-13 South Garo hills showed 4.60 per cent of increase in area. In Ri-bhoi

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(0.32%) district and East Khasi hills district (0.062%) showed positive growth but insignificantly. West Khasi hills (-0.58%) and East Garo hills (-4.88%) districts showed negative growth in the study period but insignificantly.

### 3.2. Growth rate of production of potato in Meghalaya (2005-06 to 2012-13)

The trend value of production for various districts of Meghalaya state for period 2005-06 to 2012-13 have been

presented in Table 2. The growth of potato in terms of production was increasing across all the districts except Jaintia hills (-13.06%) and West Khasi hills districts (-2.10). Highest compound annual growth of production has been observed in East Garo hills and South Garo hills districts 3.76 and 3.51 per cent respectively. The production of potato in Ri-bhoi and East Khasi hills districts had risen non-significantly at the rate 1.05 and 0.42 respectively.

**Table 1. Growth rate of Area of potato in Meghalaya (2005-06 to 2012-13)**

Particulars(Area)	Trend value	P-value	Equation	CAGR (%)
Ri Bhoi	0.0032	0.78 <sup>NS</sup>	3.29+0.003x	0.32
East Khasi hills	0.0006	0.7 <sup>NS</sup>	9.33+0.0006x	0.062
West Khasi hills	-0.006	(0.13) <sup>NS</sup>	8.65-0.005x	-0.58
Jaintia hills	-0.05	0.05	5.61-0.05x	-4.88
East Garo hills	-0.0002	(0.97) <sup>NS</sup>	4.89-0.0002x	-0.024
West Garo hills	0.032	0.05	6.08+0.032x	3.28
South Garo hills	0.045	0.01	3.81+0.04x	4.60
Meghalaya	-0.001	0.58 <sup>NS</sup>	9.79-0.001x	-0.106

**Table.2 Growth rate of production of potato in Meghalaya (2005-06 to 2012-13)**

Particulars	Trend value	P-value	Equation	CAGR (%)
Ri Bhoi	0.01	0.25 <sup>NS</sup>	5.02+0.01x	1.05
East Khasi hills	0.042	0.26 <sup>NS</sup>	11.58+0.004x	0.42
West Khasi hills	-0.021	0.34 <sup>NS</sup>	10.92-0.0212x	-2.10
Jaintia hills	-0.14	0.05	7.79-0.14x	-13.06
East Garo hills	0.01	0.1	6.87+0.01	1.05
West Garo hills	0.04	0.01	8.11+0.04x	3.76
South Garo hills	0.034	0.01	5.86+0.034x	3.51
Meghalaya	-0.004	0.5 <sup>NS</sup>	12.05-0.004x	-0.43

### 3.3. Growth rate of Area of potato in Meghalaya (2013-14 to 2017-18)

The CAGR of area for potato for various districts of Meghalaya for the period of 2013-14 to 2017-18 have been calculated in table 3. Table reveals that annual growth rate of area was positive for all districts significantly at slow rate. The highest growth was at 10.16 per cent recorded in East Jaintia hills followed by Ri-bhoi district (8.09%). All states showed positive growth significantly in study period but except East Garo hills (1.25%) and North Garo hills districts (1.56%) area grown insignificantly. Over all in Meghalaya area under potato increased significantly at a rate of 0.72 per annum during period of 2013-14 to 2017-18.

### 3.4. Growth rate of production of potato in Meghalaya (2013-14 to 2017-18)

The CAGR of area for potato for various districts of Meghalaya for the period of 2013-14 to 2017-18 have been calculated in table 4. Table reveals that annual growth rate of area was positive for all districts significantly at slow rate. The highest growth was at 10.16 per cent recorded in East Jaintia hills followed by Ri-bhoi district (8.09%). All states showed positive growth significantly in study period but except East Garo hills (1.25%) and North Garo hills districts (1.56%) area grown insignificantly. Over all in Meghalaya area under potato increased significantly at a rate of 0.72 per annum during period of 2013-14 to 2017-18

**Table.3 Growth rate of Area of potato in Meghalaya (2013-14 to 2017-18)**

Particulars	Trend value	P-value	Equation	CAGR (%)
Ri Bhoi	0.078	0.05	$3.27+0.078x$	8.09
East Khasi hills	0.005	0.05	$9.36+0.005x$	0.55
West Khasi hills	0.007	0.05	$8.20+0.007x$	0.70
South West Khasi hills	0.009	0.05	$7.58+0.009x$	0.93
East Jaintia hills	0.09	0.01	$3.56+0.09x$	10.16
West Jaintia hills	0.03	0.05	$5.12+0.031x$	3.15
East Garo hills	0.012	0.18 <sup>NS</sup>	$4.34+0.012x$	1.25
North Garo hills	0.015	0.22 <sup>NS</sup>	$4.01+0.015x$	1.56
West Garo hills	0.021	0.05	$5.8+0.021x$	2.09
South West Garo hills	0.005	0.01	$5.41+0.005x$	0.53
South Garo hills	0.03	0.05	$4.13+0.027x$	2.7
Meghalaya	0.007	0.05	$9.81+0.007x$	0.72

**Table 4. Growth rate of production of potato in Meghalaya (2013-14 to 2017-18)**

Particulars	Trend value	P-value	Equation	CAGR (%)
Ri Bhoi	0.085	0.05	$5.07+0.085x$	8.88
East Khasi hills	0.007	0.05	$11.7+0.007x$	0.73
West Khasi hills	0.008	0.01	$10.19+0.008x$	0.81
South West Khasi hills	0.009	0.05	$10.13+0.91x$	0.91
East Jaintia hills	0.10	0.10	$5.29+0.10x$	10.81
West Jaintia hills	0.032	0.05	$6.72+0.03x$	3.22
East Garo hills	0.008	0.38 <sup>NS</sup>	$6.44+0.008x$	0.77
North Garo hills	0.012	0.29 <sup>NS</sup>	$6.12+0.012x$	1.21
West Garo hills	0.157	0.16 <sup>NS</sup>	$7.28+0.16x$	16.9
South West Garo hills	0.009	0.05	$7.62+0.009x$	0.9
South Garo hills	0.022	0.05	$6.13+0.02x$	2.23
Meghalaya	0.008	0.05	$12.1+0.008x$	0.82

In conclusion, in the study period 2005-06 to 2012-13 overall Meghalaya has shown negative growth in both area and production. But in between 2013-14 to 2017-18, total Meghalaya has shown positive growth rate.

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