

Original Research Article

Identification of efficient cropping zone for major Vegetable crops in different districts of Chhattisgarh

ABSTRACT

A study was carried out in the department of vegetable science, IGKV Raipur to identify the efficient cropping zones for major vegetable crops grown in different districts of Chhattisgarh. The data on area, production and productivity of the Major Vegetable crops (Tomato, Potato, Chilly, Brinjal, Onion, Cauliflower, Cabbage & Okra) for 6 years (2004-05 to 2010-11) & 8 years (2011-12 to 2018-19) were collected from the Directorate of Horticulture & Farm Forestry (Department of Agriculture, Government of Chhattisgarh) & Directorate of Economics and Statistics, Government of Chhattisgarh. Two indices i.e. Relative Spread Index (RSI) and Relative Yield Index (RYI) were computed and the potential cropping districts for the study crops were identified. The outcome of study obtained from 2004-05 to 2010-11, revealed that out of 18 districts, three, one, four, three, four, two, four & two districts were found most efficient cropping zones (MECZ) for Tomato, Potato, Chilly, Brinjal, Onion, Cauliflower, Cabbage & Okra, respectively. Out of 18 districts, four, six, four, five, five, three, seven & six districts were falls under efficient cropping zones (ECZ) for Tomato, Potato, Chilly, Brinjal, Onion, Cauliflower, Cabbage & Okra, respectively. In Chhattisgarh, among 18 districts, six, five, four, three, three, four, two and five districts were considered as a less efficient cropping zones (LECZ) for Tomato, Potato, Chilly, Brinjal, Onion, Cauliflower, Cabbage & Okra, respectively. Similarly, out of 18 districts of the state, five, six, six, seven, six, nine, five and five districts were categorized under not efficient cropping zones (NECZ) for Tomato, Potato, Chilly, Brinjal, Onion, Cauliflower, Cabbage & Okra, respectively.

Results obtained during 2011-12 to 2018-19 revealed that out of 27 districts, four, three, three, one, six, four, six & two districts were considered as most efficient cropping zones (MECZ) for Tomato, Potato, Chilly, Brinjal, Onion, Cauliflower, Cabbage & Okra, respectively. Similarly, seven, ten, eight, seven, five, five, five & six were falls under efficient cropping zones (ECZ) for Tomato, Potato, Chilly, Brinjal, Onion, Cauliflower, Cabbage & Okra, respectively. While, five, seven, six, six, six, six, five and eight districts were considered as a less efficient cropping zones (LECZ) for Tomato, Potato, Chilly, Brinjal, Onion, Cauliflower, Cabbage & Okra, respectively. Among 27 districts of the state, eleven, seven, ten, thirteen, ten, eleven, eleven and eleven districts are considered under not efficient cropping zones (NECZ) for Tomato, Potato, Chilly, Brinjal, Onion,

Cauliflower, Cabbage & Okra, respectively.

The outcome of analysis of long term data of area & production of vegetable crops grown in different districts of Chhattisgarh indicated that the area and production of various vegetable crops has been shifted from old districts two new districts during the period of 2004-2010 and 2011-2018.

Key words: Efficient cropping zones, RSI, RYI, MECZ, LECZ & NECZ

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INTRODUCTION

India's diverse climate ensures availability of all varieties of fresh vegetables though out the year. It ranks second in vegetables production in the world, after China. As per National Horticulture Database (Second Advance Estimates) published by National Horticulture Board, during 2019-20, India produced 191.77 million metric tonnes of vegetables. The area under cultivation of vegetables stood at 10.35 million hectares. The vast production base offers India tremendous opportunities for export. During 2020-21, India exported vegetables worth Rs. 4,969.73 crores/667.61 Millions US \$. Onions, Mixed Vegetables, Potatoes, Tomatoes, and Green Chilly contribute largely to the vegetable export basket. In spite of sizable area under vegetable crops and good amount of production in our country, still the per capita availability is comparatively low as recommended by WHO. So we have to identify the efficient area which is suitable to grow vegetable production and can thereby we can increase the productivity of vegetables per unit area and time.

Efficient Cropping Zones (ECZ) is a potential area of the respective crops which can identify with the help of calculated Relative Yield Index (RYI) and Relative Spread Index (RSI) which in turn efficient cropping zone for the respective crops (**Veeraputhiran and Kathikeyan 2003**). In crop production, an efficient zone is an area which has suitable soil and climate to obtain the maximum productivity of a crop (**Narayanan et al. 2003**). The productivity level of each and every crop is varying from place to place and therefore, identification of efficient cropping zone will be helpful to prepare a strategic plan for optimum use of available resource & obtaining higher yield. On the basis of outcome of this study, we can identify the area suitable for particular crops, if crops not fall an efficient cropping zone then that crop can be replaced by the other suitable crops which have good potential to achieve optimum yield (**Thavaprakash et al. 2008**).

MATERIAL AND METHOD

The data related to area, production and productivity of Tomato, Potato, Chilly, Brinjal, Okra, Onion, Cauliflower & Cabbage crops and total cultivable area in 18 districts of Chhattisgarh were collected for 2004–05 to 2010– 2011 (06 years) & 27 districts of Chhattisgarh were collected

for 2011-12 to 2018-19 (08 years) from the directorate of horticulture, Raipur Chhattisgarh and directorate of economics and statistics, Government of Chhattisgarh. The formula given by **Kanwar (1972)** was used to find out Relative Spread Index (RSI) and Relative Yield Index (RYI) for each crop to identify efficient crop zone for the selected/respective vegetable crops in 18 and 27 districts of Chhattisgarh. The details are given here under

$$RSI = \frac{\text{Area of particular crop expressed as percentage of total cultivable area in the district}}{\text{Area of crop expressed as percentage to the total cultivable area in the state}} \times 100$$

Where,

RSI: Relative Spread Index.

$$RYI = \frac{\text{Mean yield of a particular crop in a district (Kg/ha)}}{\text{Mean yield of the crop in the state (Kg/ha)}} \times 100$$

Where,

RYI: Relative Yield Index

Chart 1: Criteria for efficient cropping zone

S. No.	RSI	RYI	Combination of RSI and RYI	Cropping Zone
01	>100 (High)	>100 (High)	High + High	Most Efficient Cropping Zone (MECZ)
02	<100 (Low)	>100 (High)	Low + High	Efficient Cropping Zone (ECZ)
03	>100 (High)	<100 (Low)	High + Low	Less Efficient Cropping Zone (LECZ)
04	<100 (Low)	<100 (Low)	Low + Low	Not Efficient Cropping Zone (NECZ)

RESULTS AND DISCUSSION

Efficient Cropping Zone for Tomato

During the study period of 2004-2010 (6 Years), results shown in table 1 (a) & (b) revealed that out of 18 districts, the district Durg, Mahasamund and Raigarh falls under Most Efficient Cropping Zone (MECZs). The district Dantewada, Bastar, Kabirdham and Narayanpur were considered as a Efficient Cropping Zone (ECZs) were in RSI Value was low & RYI Value was high. Although the productivity of tomato in these districts was high but its spread is low, so efforts should be made to increase the area of tomato crop. The district Bilaspur, Janjgir, Jashpur, Korea, Raipur and Surguja comes under Less Efficient Cropping Zone (LECZs). Lastly, district like Bijapur, Dhamtari, Kanker, Korba & Rajnandgaon reported Under the Not Efficient Cropping Zone (NECZs).

It is quite clear from the table 3 (a) & (b) that during the 8 years of study period (2011-2018) out of 27 districts in Chhattisgarh, only four district viz Durg, Korla, Narayanpur & Raipur were considered as Most Efficient Cropping Zone (MECZs) both the value of RSI and RYI were high. Similarly, the district Balod, Bemetara, Janjgir, Kabirdham, Mahasmund, Mungeli & Sukma considered as Efficient cropping zones (ECZs), whereas the district Bilaspur, Jashpur, Kondagaon, Raigarh & Surguja falls under Less Efficient Cropping Zone (LECZs). The District

Balodabazar, Balrampur, Bijapur, Dantewada, Dhamtari, Gariyaband, Jagdalpur, Kanker, Korba, Rajnandgaon, Surajpur were considered under Not Efficient Cropping Zone (NECZs).

Table A - Shifting of district during study period I 2004 -10 to 2011-18 for Tomato cultivation

S. No.	Category	Study Period I(2004 -10)	Study Period II (2010-18)
1.	MECZ	Durg, Mahasamund & Raigarh	Durg, Korla, Narayanpur & Raipur
2.	ECZ	Dantewada, Bastar, Kabirdham and Narayanpur	Balod, Bemetara, Janjgir, Kabirdham, Mahasmund, Mungeli & Sukma
3	LECZ	Bilaspur, Janjgir, Jashpur, Korea, Raipur and Surguja	Bilaspur, Jashpur, Kondagaon, Raigarh & Surguja
4	NECZ	Bijapur, Dhamtari, Kanker, Korba & Rajnandgaon	Balodabazar, Balrampur, Bijapur, Dantewada, Dhamtari, Gariyaband, Jagdalpur, Kanker, Korba, Rajnandgaon, Surajpur

It is clear from Table A, that district Korla, Narayanpur & Raipur emerge as Most Efficient Cropping Zone for tomato cultivation during 2010-2018

Efficient Cropping Zone for Potato

During the study period of 2004-2010, only one district i.e Raigarh reported as the Most Efficient Cropping Zone (MECZs), because of the High RSI and RYI value as shown in table 1 (a) & (b) for Potato crop. The district Dantewada, Dhamtari, Durg, Jagdalpur, Kabirdham & Raipur comes under Efficient Cropping Zone (ECZs) with low RSI and High RYI. Though the yield potential is good, the spread is low and hence efforts should be made mainly to increase the area of this crop. Under Less Efficient Cropping Zone (LECZs) most of the districts comes because for high RSI and low RYI in the district Bilaspur, Jashpur, Korba, Koriya & Sarguja. Out of 18 districts, 6 districts they are Bijapur, Janjgir, Kanker, Mahasmund, Narayanpur & Rajnandgaon falls under Not Efficient Cropping Zone (NECZs) with both low RSI and RYI.

A close observation of table 3 (a) & (b) indicated that the district Jashpur, Raipur & Surajpur were categorized under the Most Efficient Cropping Zone (MECZs) because of high RSI and high RYI value of Potato crop during the study period of 2011-2018. The district Dantewada, Durg, Jagdalpur, Janjgir, Balod, Bemetara, Kabirdham, Mungeli, Narayanpur & Sukma comes under Efficient Cropping Zone (ECZs) with high RYI and low RSI Value. Though the yield potential good in these districts but the area is low and hence efforts should be made to increase the area of this crop with the help of public and pvt sectors. Out of 27 Districts, 7 Districts, they are Korba, Koriya, Balrampur, Bilaspur, Kondagaon, Raigarh & Surguja considered as Less Efficient Cropping Zone (LECZs). Lastly, the district Balodabazar, Bijapur, Dhamtari, Gariyaband, Kanker, Mahasmund & Rajnandgaon falls under Not Efficient Cropping Zone (NECZs). In these districts

crop diversification is required.

Table B - Shifting of district during study period I 2004 -10 to 2011-18 for Potato cultivation

S. N.	Category	Study Period I(2004 -10)	Study Period II(2010-18)
1.	MECZ	Raigarh	Jashpur, Raipur & Surajpur
2.	ECZ	Dantewada, Dhamtari, Durg, Jagdalpur, Kabirdham & Raipur.	Dantewada, Durg, Jagdalpur, Janjgir, Balod, Bemetara, Kabirdham, Mungeli, Narayanpur & Sukma
3	LECZ	Bilaspur, Jashpur, Korba, Koriya & Surguja.	Korba, Koriya, Balrampur, Bilaspur, Kondagaon, Raigarh & Surguja
4	NECZ	Bijapur, Janjgir, Kanker, Mahasmund, Narayanpur & Rajnandgaon	Balodabazar, Bijapur, Dhamtari, Gariyaband, Kanker, Mahasmund & Rajnandgaon

District Jashpur, Raipur & Surajpur emerge as Most Efficient Cropping Zone for potato cultivation during 2010-2018

Efficient Cropping Zone for Chilly

It is quite clear from the table 1 (a) & 1 (b) that the outcome of analysis of 06 years data (2004-2010) of area and production of chilly crop revealed that district Bilaspur, Kabirdham, Korba & Surguja were considered as Most Efficient Cropping Zone (MECZs) because of the high RSI & RYI Value. Here high-tech production technology can be introduced to harness potential yield of the crop. The district Bijapur, Dhamtari, Janjgir & Kanker falls under Efficient Cropping Zone (ECZs) with low RSI & high RYI values. The district Jashpur, Koriya, Narayanpur & Raigarh considered as Less Efficient Cropping Zone (LECZs) where the RSI value was high but and RYI low values. Among 18 districts Dantewada, Durg, Jagdalpur, Mahasamund, Raipur & Rajnandgaon comes under Not Efficient Cropping Zone (NECZs) where both RSI and RYI values both were below 100 per cent.

During the period of 2011-2018, the district Kabirdham, Korba & Surguja reported as Most Efficient Cropping Zone (MECZs) which has high RSI and RYI value for Chilly cultivation. The district Dhamtari, Balrampur, Jagdalpur, Kanker, Mahasmund, Mungeli, Raipur & Surajpur were categorized under Efficient Cropping Zone (ECZs) with low RSI & high RYI values which indicates that in this district areas under chilly cultivation is less but production is high. The outcome of 27 districts reported that the, district Bilaspur, Durg, Koriya, Kondagaon, Narayanpur and Raigarh falls under Less Efficient Cropping Zone (LECZs), while the district Sukma, Gariyaband, Bemetara, Balod, Balodabazar, Bijapur, Dantewada, Janjgir, Jashpur & Rajnandgaon were considered as Not Efficient Cropping Zone (NECZs) as shown in the table 3 (a) & (b).

Table C - Shifting of district during study period I 2004 -10 to 2011-18 for Chilly cultivation

S. N.	Category	Study Period I(2004 -10)	Study Period II(2010-18)
1	MECZ	Bilaspur, Kabirdham, Korba & Surguja	Kabirdham, Korba & Surguja
2	ECZ	Bijapur, Dhamtari, Janjgir & Kanker	Dhamtari, Balrampur, Jagdalpur, Kanker, Mahasmund, Mungeli, Raipur & Surajpur
3.	LECZ	Jashpur, Koriya, Narayanpur & Raigarh	Bilaspur, Durg, Koriya, Kondagaon, Narayanpur and Raigarh
4.	NECZ	Mahasamund, Raipur & Rajnandgaon	Sukma, Gariyaband, Bemetara, Balod, Balodabazar, Bijapur, Dantewada, Janjgir, Jashpur & Rajnandgaon

Above Table C indicates that only one district *i.e.* Bilaspur which has been shifted from most efficient cropping zone to efficient cropping zone otherwise there was no change in MECZ category

Efficient Cropping Zone for Brinjal

A close observation of table 1 (a) & (b) indicates that the district Durg, Narayanpur & Korba were categorized under Most Efficient Cropping Zone (MECZs) for Brinjal cultivation during the period of 2004-2010 (06 years) because of high RSI & RYI Values. Out of 18 districts, 5 district they are Dantewada, Dhamtari, Jagdalpur, Mahasamund & Raigarh, falls under Efficient Cropping Zone (ECZs) as RSI value is low & RYI. The district Kanker, Raipur & Sarguja were considered as Less Efficient Cropping Zone (LECZs) because of high RSI Values and low RYI Values. Out of 18 districts, Seven districts (Bijapur, Bilaspur, Janjgir, Jashpur, Kabirdham, Koriya & Rajnandgaon) comes under Not Efficient Cropping Zone (NECZs) where in RSI and RYI values both were low.

It is quite clear from the table 3 (a) & (b) that during the period of 2011 to 2018 the district Durg recorded High RSI & High RYI values therefore it is considered as Most efficient cropping zone (MECZs). Out of 27 districts, 7 districts Balod, Bemetara, Janjgir, Kabirdham, Koriya, Mungeli & Sukma exhibits low RSI & High RYI values and were classified as Efficient Cropping Zone (ECZs). In contrast to this, 6 districts viz Surguja, Raipur, Naryanpur, Korba, Kondagaon & Bilaspur where in area under Brinjal crop was more but the production is comparatively low, hence they are categorized under Less Efficient Cropping Zone (LECZs). Among 27 districts, 13 districts Balodabazar, Balrampur, Bijapur, Dantewada, Dhamtari, Gariyaband, Jagdalpur, Jashpur, Kanker, Mahasmund, Raigarh, Surajpur & Rajnandgaon falls under Not Efficient Cropping Zone (NECZs) due to less area and low production.

Table D - Shifting of district during study period I 2004 -10 to 2011-18 for Brinjal cultivation

S. No.	Category	Study Period I(2004-10)	Study Period II(2010-18)
1.	MECZ	Durg, Narayanpur & Korba	Durg
2.	ECZ	Dantewada, Dhamtari, Jagdalpur, Mahasamund & Raigarh	Balod, Bemetara, Janjgir, Kabirdham, Koriya, Mungeli & Sukma
3.	LECZ	Kanker, Raipur & Sarguja	Surguja, Raipur, Naryanpur, Korba, Kondagaon & Bilaspur.
4.	NECZ	Bijapur, Bilaspur, Janjgir, Jashpur, Kabirdham, Koriya & Rajnandgaon	Balodabazar, Balrampur, Bijapur, Dantewada, Dhamtari, Gariyaband, Jagdalpur, Jashpur, Kanker, Mahasmund, Raigarh, Surajpur & Rajnandgaon

It is clear from the above Table D that there has been changes in most efficient cropping zone and Narayanpur & Korba district shifted from MECZ to LECZ while, only one district, Durg remain in same category i.e. under MECZ.

Efficient Cropping Zone for Onion

The outcome of analysis of data (2004-2010) of Area and Production of onion crop as shown in table 2 (a) & (b) reported that the district Dhamtari, Mahasmund, Raigarh & Sarguja reported higher values of RSI and RYI considered under Most efficient cropping zone (MECZs). The district Dantewada, Durg, Jagdalpur, Janjgir & Raipur comes under Efficient Cropping Zone (ECZs) with low RSI & high RYI Values. Although the yield potential was good, but the spread is low and hence efforts should be made to increase the area of this crop. Out of 27 districts, 3 districts Korba, Koriya, Narayanpur considered as Less Efficient Cropping Zone (LECZs). Among 27 districts, 6 districts Bijapur, Bilaspur, Jashpur, Kabirdham, Kanker & Rajnandgaon categorized under Not Efficient Cropping Zone (NECZs).

The perusal of table 4 (a) & (b) indicates that the district Balrampur, Durg, Kanker, Koriya, Narayanpur & Raipur falls under Most Efficient Cropping Zone (MECZs) because of high RSI and RYI value. Out of 27 districts, 5 districts they are Balod, Bemetara, Gariyaband, Janjgir & Mungeli comes under Efficient Cropping Zone (ECZs) because its RSI value was low and RYI Value was high. High Value of RSI & low RYI Value obtain through analysis indicates that the district Kondagaon, Korba, Mahasamund, Raigarh, Surajpur and Surguja considered as Less Efficient Cropping Zone (LECZs). Among 27 districts, 10 districts they are Balodabazar, Bijapur, Bilaspur, Dantewada, Dhamtari, Jagdalpur, Jashpur, Kabirdham, Sukma & Rajnandgaon categorized under Not Efficient Cropping Zone (NECZs).

Table E - Shifting of district during study period I 2004 -10 to 2011-18 for Onion cultivation

S. N.	Category	Study Period I(2004-10)	Study Period II(2010-18)
1	MECZ	Dhamtari, Mahasmund, Raigarh & Sarguja	Balrampur, Durg, Kanker, Koriya, Narayanpur & Raipur
2	ECZ	Dantewada, Durg, Jagdalpur, Janjgir & Raipur	Balod, Bemetara, Gariyaband, Janjgir & Mungeli
3	LECZ	Korba, Koriya, Narayanpur	Kondagaon, Korba, Mahasamund, Raigarh, Surajpur and Surguja
4	NECZ	Bijapur, Bilaspur, Jashpur, Kabirdham, Kanker & Rajnandgaon	Balodabazar, Bijapur, Bilaspur, Dantewada, Dhamtari, Jagdalpur, Jashpur, Kabirdham, Sukma & Rajnandgaon

It is clear from above Table E that District Balrampur, Durg, Kanker, Koriya, Narayanpur & Raipur emerge as most efficient cropping zone for onion cultivation during 2010-2018.

Efficient Cropping Zone for Cauliflower

The results shown in table 2 (a) & (b) indicate that during 2004-2010 the district Durg & Narayanpur where high RSI & RYI Value recorded was considered as the Most Efficient Cropping Zone (MECZs). Out of 18 districts, 3 districts Dhamtari, Kabirdham & Raigarh categorized under Efficient Cropping Zone (ECZs) with low RSI values & high RYI values.. Among 18 districts, the district Kanker, Korba, Koriya and Raipur considered as Less Efficient Cropping Zone (LECZs) because of high RSI & low RYI Values. Considering the low area & low production the district Bijapur, Bilaspur, Dantewada, Jagdalpur, Janjgir, Jashpur, Mahasmund, Rajnandgaon and Sarguja falls under Not Efficient Cropping Zone (NECZs).

It is quite clear from the table 4 (a) & (b) that the district Raipur, Kondagaon, Durg, Bemetara, Balod considered as the Most Efficient Cropping Zone (MECZs) with high RSI and high RYI values for Cauliflower cultivation during the period of 2011-2018. Among 27 districts, 5 districts Balodabazar, Janjgir, Kabirdham, Mungeli, Sukma falls under Efficient Cropping Zone (ECZs) with low RSI values & high RYI Values. Out of 27 districts, 6 districts Bilaspur, Korba, Koriya, Narayanpur, Surajpur & Surguja district categorized under Less Efficient Cropping Zone (LECZs) where the districts registered high RSI and low RYI values. Among 27 districts, 11 districts Balrampur, Bijapur, Dhamtari, Gariyaband, Kanker, Dantewada, Jagdalpur, Jashpur, Korba, Mahasamund, Raigarh & Rajnandgaon comes under Not Efficient Cropping Zone (NECZs) where area & production of cauliflower was less below 100 %.

Table F- Shifting of district during study period I 2004 -10 to 2011-18 for Cauliflower cultivation

S. N.	Category	Study Period I(2004-10)	Study Period II(2011-18)
1	MECZ	Durg & Narayanpur	Raipur, Kondagaon,Durg, Bemetara, Balod
2	ECZ	Dhamtari, Kabirdham& Raigarh	Balodabazar, Janjgeer, Kabirdham,Mungeli, Sukma
3	LECZ	Kanker, Korba, Koriya and Raipur	Bilaspur, Korba, Koriya, Narayanpur, Surajpur & Surguja
4.	NECZ	Bijapur, Bilaspur, Dantewada, Jagdalpur, Janjgir, Jashpur, Mahasmund,Rajnandgaon and Sarguja	Balrampur, Bijapur, Dhamtari, Kanker, Gariyaband, Dantewada, Jagdalpur, Jashpur, Korba, Mahasamund,Raigarh & Rajnandgaon

Above table F indicates that District Raipur, Kondagaon,Durg, Bemetara, Balod considered as most efficient cropping zone for cauliflower cultivation during 2011-2018

Efficient Cropping Zone for Cabbage

A close observation of table 2 (a) & (b) indicates that the district Durg, Korba, Narayanpur & Raigarh falls under Most efficient cropping zone (MECZs) because of high value of RSI & RYI during 2004-2010. Out of 18 districts, 7 districts Dantewada, Dhamtari, Jagdalpur, Kabirdham, Kanker, Mahasmund & Sarguja exhibits low area under cabbage cultivation with high production was classified as Efficient Cropping Zone (ECZs). In contrast to this, 2 districts viz Bilaspur, Koriya, were area under Cabbage cultivation was more but the production was low, categorized under Less Efficient Cropping Zone (LECZs). Among 18 districts, 5 districts Bijapur, Janjgir, Jashpur, Raipur & Rajnandgaon considered as Not Efficient Cropping Zone (NECZs) due to both less spread and low productivity.

During the study period of 2011 to 2018 table 4 (a) & (b) indicates that 6 districts Balod, Bemetara, Durg, Korba, Narayanpur, Raipur, considered as Most Efficient Cropping Zone (MECZs), mainly because of Higher value registered for RSI & RYI. Among 27 districts, 5 districts Balodabazar, Dantewada, Janjgir, Mungeli & Sukma categorized under Efficient Cropping Zone (ECZs) with low RSI and High RYI values. Under Less Efficient Cropping Zone (LECZs) most of the districts comes because for high area and low yield they are district Bilaspur, Kondagaon, Korba, Surajpur & Surguja. Out of 27 districts, 11 districts (Balrampur, Bijapur, Dhamtari, Gariyaband, Janjgir, Jagdalpur, Jashpur, Kanker, Mahasamund, Raigarh & Rajnandgaon) falls under Not Efficient Cropping Zone (NECZs) with both low RSI and RYI.

Table G - Shifting of district during study period I 2004 -10 to 2011-18 for Cabbage cultivation

S. No.	Category	Study Period I(2004-10)	Study Period II(2010-18)
1	MECZ	Durg, Korba, Narayanpur & Raigarh	Balod, Bemetara, Durg, Korba, Narayanpur, Raipur.
2	ECZ	Dantewada, Dhamtari, Jagdalpur, Kabirdham, Kanker, Mahasmund & Surguja	Balodabazar, Dantewada, Janjgir, Mungeli & Sukma
3	LECZ	Bilaspur, Koriya,	Bilaspur, Kondagaon, Koria, Surajpur & Surguja
4.	NECZ	Bijapur, Janjgir, Jashpur, Raipur & Rajnandgaon	Balrampur, Bijapur, Dhamtari, Kabirdham, Gariyaband, Janjgir, Jagdalpur, Jashpur, Kanker, Mahasmund, Raigarh & Rajnandgaon

It quite clear from the above Table G that for profitable cultivation of cabbage the district Balod, Bemetara, Durg, Korba, Narayanpur and Raipur considered as most efficient cropping zone during 2010-2018

Efficient Cropping Zone for Okra

The results of analysis for the period of 2004-2010 as shown in table 2 (a) & (b) indicates that out of 18 districts, two Districts viz Durg & Korba were considered as Most Efficient Cropping Zone (MECZs) because the RSI and RYI value were high. The district Bijapur, Dantewada, Dhamtari, Jagdalpur, Kabirdham & Raigarh categorized under Efficient Cropping Zone (ECZs) as its RSI Value was low and RYI was high. Out of 18 districts, 5 districts Kanker, Koriya, Narayanpur, Raipur & Surguja considered as Less Efficient Cropping Zone (LECZs) because of high RSI & low RYI Values. The district Bilaspur, Janjgir, Jashpur, Mahasmund, Raigarh were Categorized under Not Efficient Cropping Zone (NECZs) because its RSI & RYI Value were below 100%.

It is quite clear from the table 4 (a) & (b) that the district Dhamtari & Surguja were categorized under Most Efficient Cropping Zone (MECZs) for Okra crop during the study period of 2011-2018 because of its Higher RSI & RYI Value. Base on low RSI & high RYI Value, among 27 districts, 6 districts (Balodabazar, Kabirdham, Mungeli, Raigarh, Sukma & Surajpur) were kept under Efficient Cropping Zone (ECZs). The district Balrampur, Durg, Bilaspur, Kondagaon, Korba, Koriya, Narayanpur & Raipur were considered as Less Efficient Cropping Zone (LECZs) because of its high RSI & low RYI values. Out of 27 districts, 11 districts (Balod, Bemetara, Bijapur, Dantewada, Gariyaband, Jagdalpur, Janjgir, Jashpur, Korba, Mahasamund &

Rajnandgaon) comes under Not Efficient Cropping Zone (NECZs) because of low RSI and RYI Values.

Table H - Shifting of district during study period I 2004 -10 to 2011-18 for Okra cultivation

S. N.	Category	Study Period I(2004-10)	Study Period II(2011-18)
1	MECZ	Durg & Korba	Dhamtari & Surguja
2	ECZ	Bijapur, Dantewada, Dhamtari, Jagdalpur, Kabirdham & Raigarh	Balodabazar, Kabirdham, Mungeli, Raigarh, Sukma & Surajpur
3	LECZ	Kanker, Koriya, Narayanpur, Raipur & Surguja	Balrampur, Durg, Bilaspur, Kondagaon, Korba, Koriya, Narayanpur & Raipur
4.	NECZ	Bilaspur, Janjgir, Jashpur, Mahasamund, Rajnandgaon	Balod, Bemetara, Bijapur, Dantewada, Gariyaband, Kanker, Jagdalpur, Janjgir, Jashpur, Korba, Mahasamund & Rajnandgaon

During 2010-2018 the district Dhamtari & Surguja identify as a most efficient cropping zone for cultivation of okra crops.

On the basis of coverage of area and status of productivity of respective crops, there are four category of Cropping Zone. They are MECZs, ECZs, LECZs, NECZs, we have analyzed the area and production of important vegetable crops grown in different districts of Chhattisgarh and accordingly crop wise results has shown in this paper. In First category those districts falls where RSI & RYI Values were high which required involvement of players of public & private sectors & use of advance high technology to increase production & productivity per unit area & time, including processing and value addition activities, will provide more production and good quality produce as well as high net returns. The district belongs to 2nd category where the area of respective crop cultivation was comparatively low & production was high which requires activity through which we can increase the area of respective crops. The districts belong to 3rd category where the area of respective crop was high but production was low need to be addressed through which we can increase production by optimal use of advance production technology & inputs. The district which falls under 4th category here the area and production of respective crops are below 100% where crop diversification is prime need so that we can utilize the available resources of its optimum level and farmers may get maximum return from their resources and efforts.

The Results clearly indicates that the area and production of various vegetable crops grown in different districts has been shifted from the period of 2004-10 to 2011-2018. The possible reason might be due to formation of new districts, change in prevailing agro climatic condition, physiographic consideration, socio economic consideration, availability of advance production

technology as well as production inputs, focused implementation of Govt. policies, availability of facilities for processing and value addition and proper market linkages and demand etc.

Many studies on quantitative analysis of efficient cropping zone done by several researchers such as **Sankar and Kowshika (2020)** reported that the trend analysis of potato production was decreasing till early 21st century and thereafter increasing gradually with respect to cropping area and chilly showed reduction in production over the years. They also revealed the Nilgiris is sole district was falls under Most Efficient Cropping Zone (MECZ), while district Dindigul and Krishnagiri were considered as efficient cropping zone (ECZ) for potato. Among 31 districts, 28 districts were categorized under Not Efficient Cropping Zone (NECZ) in Tamil Nadu. Out of 31 districts, no any district comes under Highly Inefficient Cropping Zone (HICZ) for potato crop. They also found district Virudhunagar has been the Most Efficient Cropping Zone (MECZ) for chilly crop, while district Ramanathapuram, Sivagangai and Thoothukkudi were identified as potential efficient zone (ECZs) in Tamil Nadu. Out of 31 districts, 23 districts were considered as Not Efficient Cropping Zone (NECZ) in Tamil Nadu. Among 31 districts of Tamil nadu, 4 districts (Tiruppur, Cuddalore, Ariyalu and Kanniyakumari) categorized under Highly Inefficient Cropping Zone (HICZ) for potato crop. **Otung and Akpaeti (2016)** they concluded that the ten states (Akwa Ibom, Benue, Cross River, Enugu, Imo, Kaduna, Kogi, Oyo, Rivers and Taraba) out of thirty one (31) states spread across the six-political zones were identified as the most efficient cropping zones (MECZ) for cassava production. The outcome of 31 states reported that the, only two state Ogun & Ondo falls under Efficient Cropping Zone (ECZ), while only one state Delta was considered as Less Efficient Cropping Zone (LECZ). Two states Anambra and Osun were categorized under Not Efficient Cropping Zone (NECZ). Among 31 states, 16 states (Abuja, Abia, Adamawa, Bauchi, Bayelsa, Ebonyi, Edo, Ekiti, Gombe, Kwawa, Lagos, Nassarawa, Niger, Plateau, Sokoto & Yobe) considered as Highly Inefficient Cropping Zone (HICZ) in the Nigeria country. South-South geopolitical zone of the country had the highest number of states three (3) with the most efficient cropping zone; South-East was next with two (2) states. Others zones had one each. These were potentially mega-cassava producing hub in Nigeria.

Table 1 (a) Classification of Computed Valuation of Cropping Zone (2004-2010) of Tomato, Potato, Chilly & Brinjal

S. NO.	2004-2010 districts name	TOMATO		POTATO		CHILLY		BRINJAL	
		RSI	RYI	RSI	RYI	RSI	RYI	RSI	RYI
1	Bijapur	26.5	99.5	4.2	39.6	36.2	107.4	47.0	84.9
2	Bilaspur	231.0	73.7	102.6	91.2	158.0	107.0	91.6	81.5
3	Dantewara	45.6	146.4	6.6	128.1	55.2	63.7	46.0	101.9
4	Dhamtari	79.8	93.1	37.4	108.7	79.5	114.5	86.2	111.3
5	Durg	130.9	179.9	31.3	170.5	81.2	51.1	155.8	135.7
6	Jagdalpur	49.8	117.8	22.4	123.2	81.2	98.3	69.4	135.1
7	Janjgir	106.6	88.7	46.6	84.3	92.8	167.6	96.9	98.5
8	Jashpur	223.2	93.5	160.0	93.1	115.1	77.6	52.2	73.5
9	Kabirdham	44.6	110.7	10.9	127.0	121.0	178.0	63.8	92.6
10	Kanker	86.9	82.1	30.2	77.1	92.7	117.2	137.4	80.7
11	Korba	80.6	98.6	149.7	97.6	250.4	158.1	160.0	108.8
12	Koriya	132.1	73.7	295.8	96.7	242.0	71.2	88.6	88.3
13	Mahasmund	21.2	72.3	16.2	67.2	49.5	63.4	28.3	103.7
14	Narayanpur	95.2	105.8	42.1	88.2	164.6	54.9	158.4	108.0
15	Raigarh	171.2	113.7	197.7	118.8	163.3	82.9	91.9	121.1
16	Raipur	106.2	82.2	79.4	102.1	40.1	83.9	135.8	98.5
17	Rajnandgaon	57.9	90.4	34.1	87.7	75.6	78.9	54.5	93.2
18	Sarguja	110.6	78.0	401.8	99.0	121.5	124.4	120.9	83.0

Table 1 (b) Classification of Cropping Zone (2004-2010) of Tomato, Potato, Chilly & Brinjal

S. NO.	2004-2010 districts name	TOMATO			POTATO			CHILLY			BRINJAL		
		RSI	RYI	Cropping Zone	RSI	RYI	Cropping Zone	RSI	RYI	Cropping Zone	RSI	RYI	Cropping Zone
1	Bijapur	L	L	NECZ	L	L	NECZ	L	H	ECZ	L	L	NECZ
2	Bilaspur	H	L	LECZ	H	L	LECZ	H	H	MECZ	L	L	NECZ
3	Dantewara	L	H	ECZ	L	H	ECZ	L	L	NECZ	L	H	ECZ
4	Dhamtari	L	L	NECZ	L	H	ECZ	L	H	ECZ	L	H	ECZ
5	Durg	H	H	MECZ	L	H	ECZ	L	L	NECZ	H	H	MECZ
6	Jagdalpur	L	H	ECZ	L	H	ECZ	L	L	NECZ	L	H	ECZ
7	Janjgir	H	L	LECZ	L	L	NECZ	L	H	ECZ	L	L	NECZ
8	Jashpur	H	L	LECZ	H	L	LECZ	H	L	LECZ	L	L	NECZ
9	Kabirdham	L	H	ECZ	L	H	ECZ	H	H	MECZ	L	L	NECZ
10	Kanker	L	L	NECZ	L	L	NECZ	L	H	ECZ	H	L	LECZ
11	Korba	L	L	NECZ	H	L	LECZ	H	H	MECZ	H	H	MECZ
12	Koriya	H	L	LECZ	H	L	LECZ	H	L	LECZ	L	L	NECZ
13	Mahasmund	L	L	MECZ	L	L	NECZ	L	L	NECZ	L	H	ECZ
14	Narayanpur	L	H	ECZ	L	L	NECZ	H	L	LECZ	H	H	MECZ
15	Raigarh	H	H	MECZ	H	H	MECZ	H	L	LECZ	L	H	ECZ
16	Raipur	H	L	LECZ	L	H	ECZ	L	L	NECZ	H	L	LECZ
17	Rajnandgaon	L	L	NECZ	L	L	NECZ	L	L	NECZ	L	L	NECZ
18	Sarguja	H	L	LECZ	H	L	LECZ	H	H	MECZ	H	L	LECZ

Table 2 (a) Classification of Computed Valuation of Cropping Zone (2004-2010) of Onion, Cauliflower, Cabbage & Okra

S. NO.	2004-2010 districts name	ONION		CAULIFLOWER		CABBAGE		OKRA	
		RSI	RYI	RSI	RYI	RSI	RYI	RSI	RYI
1	Bijapur	24.2	65.0	4.9	98.2	17.3	83.3	40.1	102.5
2	Bilaspur	41.1	95.5	81.0	93.7	106.7	87.8	97.7	77.9
3	Dantewara	11.8	112.2	15.1	96.0	16.1	113.9	49.6	104.4
4	Dhamtari	123.6	105.2	67.9	115.6	94.1	104.7	87.6	107.8
5	Durg	71.6	162.8	211.0	107.2	234.7	119.0	145.6	105.7
6	Jagdalpur	31.5	187.5	82.4	94.5	88.8	120.7	50.8	113.5
7	Janjgir	72.9	115.9	73.1	94.7	92.9	91.2	90.5	72.4
8	Jashpur	61.1	95.6	28.9	96.4	61.9	76.1	43.5	87.7
9	Kabirdham	92.6	95.3	38.8	123.9	30.4	113.8	44.4	103.2
10	Kanker	97.0	88.2	128.4	88.3	58.5	103.7	107.1	91.8
11	Korba	157.4	73.5	172.4	96.6	226.4	102.3	319.8	139.2
12	Koriya	234.7	75.3	141.3	72.7	133.9	87.3	177.8	96.8
13	Mahasbund	55.9	48.2	27.1	93.8	29.8	105.8	20.4	86.1
14	Narayanpur	134.0	78.4	183.0	127.9	132.4	103.8	147.8	95.8
15	Raigarh	239.0	121.8	71.1	123.9	124.4	113.1	96.3	147.3
16	Raipur	67.2	109.5	146.7	98.2	83.4	89.7	134.3	89.1
17	Rajnandgaon	57.0	65.9	41.3	94.9	19.8	78.4	51.8	99.1
18	Sarguja	279.1	104.0	99.0	83.5	87.3	105.4	115.4	79.8

Table 2 (b) Classification of Cropping Zone (2004-2010) of Onion, Cauliflower, Cabbage & Okra

	2004-2010	ONION			CAULIFLOWER			CABBAGE			OKRA		
S. NO.	districts name	RSI	RYI	Cropping Zone	RSI	RYI	Cropping Zone	RSI	RYI	Cropping Zone	RSI	RYI	Cropping Zone
1	Bijapur	L	L	NECZ	L	L	NECZ	L	L	NECZ	L	H	ECZ
2	Bilaspur	L	L	NECZ	L	L	NECZ	H	L	LECZ	L	L	NECZ
3	Dantewara	L	H	ECZ	L	L	NECZ	L	H	ECZ	L	H	ECZ
4	Dhamtari	H	H	MECZ	L	H	ECZ	L	H	ECZ	L	H	ECZ
5	Durg	L	H	ECZ	H	H	MECZ	H	H	MECZ	H	H	MECZ
6	Jagdalpur	L	H	ECZ	L	L	NECZ	L	H	ECZ	L	H	ECZ
7	Janjgir	L	H	ECZ	L	L	NECZ	L	L	NECZ	L	L	NECZ
8	Jashpur	L	L	NECZ	L	L	NECZ	L	L	NECZ	L	L	NECZ
9	Kabirdham	L	L	NECZ	L	H	ECZ	L	H	ECZ	L	H	ECZ
10	Kanker	L	L	NECZ	H	L	LECZ	L	H	ECZ	H	L	LECZ
11	Korba	H	L	LECZ	H	L	LECZ	H	H	MECZ	H	H	MECZ
12	Koriya	H	L	LECZ	H	L	LECZ	H	L	LECZ	H	L	LECZ
13	Mahasamund	L	L	MECZ	L	L	NECZ	L	H	ECZ	L	L	NECZ
14	Narayanpur	H	L	LECZ	H	H	MECZ	H	H	MECZ	H	L	LECZ
15	Raigarh	H	H	MECZ	L	H	ECZ	H	H	MECZ	L	H	ECZ
16	Raipur	L	H	ECZ	H	L	LECZ	L	L	NECZ	H	L	LECZ
17	Rajnandgaon	L	L	NECZ	L	L	NECZ	L	L	NECZ	L	L	NECZ
18	Sarguja	H	H	MECZ	L	L	NECZ	L	H	ECZ	H	L	LECZ

Table 3 (a) Classification of Computed Valuation of Cropping Zone (2011-2018) of Tomato, Potato, Chilly & Brinjal

	2011-2018	TOMATO		POTATO		CHILLY		BRINJAL	
S. NO.	districts name	RSI	RYI	RSI	RYI	RSI	RYI	RSI	RYI
1	Balod	74.9	152.8	14.6	132.0	26.2	43.9	78.4	140.9
2	Balodabazar	46.3	82.3	45.0	90.6	29.1	51.7	82.1	97.1
3	Balrampur	87.8	91.3	240.8	92.7	79.1	127.9	91.8	91.0
4	Bemetara	69.1	175.9	32.9	158.2	46.8	40.0	67.3	137.6
5	Bijapur	21.1	44.5	8.7	26.7	11.2	87.0	22.4	55.6
6	Bilaspur	276.1	73.6	264.7	73.7	180.8	93.5	105.6	70.6
7	Dantewada	43.9	77.1	16.1	138.4	47.0	98.5	35.0	87.9
8	Dhamtari	71.0	56.2	32.7	57.4	76.9	114.3	95.0	81.0
9	Durg	332.9	135.3	81.8	158.9	131.3	44.9	335.8	138.6
10	Gariyaband	10.7	90.2	14.4	98.3	12.5	96.5	19.4	87.9
11	Jagdalpur	45.4	77.9	17.6	107.9	85.0	141.2	70.9	89.0
12	Janjgeer	79.0	118.1	41.4	115.4	56.8	91.3	77.2	111.0
13	Jashpur	197.6	92.4	137.6	106.1	95.1	93.0	21.1	91.6
14	Kabirdham	49.6	108.9	11.0	126.6	239.4	147.5	80.3	110.0
15	Kanker	61.2	62.4	33.1	72.6	34.2	118.8	98.0	80.9
16	Kondagoan	218.5	66.0	109.7	70.7	227.8	89.4	443.8	80.7
17	Korba	66.3	91.1	151.3	76.1	268.3	100.1	141.5	98.7
18	Koria	127.4	101.6	268.7	98.0	225.4	97.5	98.3	114.3
19	Mahasamund	52.6	123.5	39.8	73.7	91.0	109.4	88.1	84.3
20	Mungeli	85.0	166.8	81.0	101.9	47.8	127.8	36.2	166.1
21	Narayanpur	103.8	104.6	51.9	115.2	152.4	132.7	181.2	72.7
22	Raigarh	125.9	91.0	148.0	99.7	235.1	94.3	73.9	91.3
23	Raipur	181.7	103.5	207.0	103.1	49.0	107.7	255.1	97.0
24	Rajnandgaon	48.4	70.1	56.9	73.6	66.0	98.5	64.4	83.3
25	Sukma	13.5	168.0	4.2	138.9	38.0	78.6	13.6	167.0
26	Surajpur	61.3	90.1	214.7	103.3	90.6	136.4	68.7	86.4
27	Surguja	120.0	84.9	482.5	90.2	188.8	137.8	142.1	87.6

Table 3 (b) Classification of Cropping Zone (2011-2018) of Tomato, Potato, Chilly & Brinjal

S.	2011-2018	TOMATO			POTATO			CHILLY			BRINJAL		
NO.	districts name	RSI	RYI	Cropping Zone	RSI	RYI	Cropping Zone	RSI	RYI	Cropping Zone	RSI	RYI	Cropping Zone
1	Balod	L	H	ECZ	L	H	ECZ	L	L	NECZ	L	H	ECZ
2	Balodabazar	L	L	NECZ	L	L	NECZ	L	L	NECZ	L	L	NECZ
3	Balrampur	L	L	NECZ	H	L	LECZ	L	H	ECZ	L	L	NECZ
4	Bemetara	L	H	ECZ	L	H	ECZ	L	L	NECZ	L	H	ECZ
5	Bijapur	L	L	NECZ	L	L	NECZ	L	L	NECZ	L	L	NECZ
6	Bilaspur	H	L	LECZ	H	L	LECZ	H	L	LECZ	H	L	LECZ
7	Dantewada	L	L	NECZ	L	H	ECZ	L	L	NECZ	L	L	NECZ
8	Dhamtari	L	L	NECZ	L	L	NECZ	L	H	ECZ	L	L	NECZ
9	Durg	H	H	MECZ	L	H	ECZ	H	L	LECZ	H	H	MECZ
10	Gariyaband	L	L	NECZ	L	L	NECA	L	L	NECZ	L	L	NECZ
11	Jagdajpur	L	L	NECZ	L	H	ECZ	L	H	ECZ	L	L	NECZ
12	Janjgeer	L	H	ECZ	L	H	ECZ	L	L	NECZ	L	H	ECZ
13	Jashpur	H	L	LECZ	H	H	MECZ	L	L	NECZ	L	L	NECZ
14	Kabirdham	L	H	ECZ	L	H	ECZ	H	H	MECZ	L	H	ECZ
15	Kanker	L	L	NECZ	L	L	NECA	L	H	ECZ	L	L	NECZ
16	Kondagoan	H	L	LECZ	H	L	LECZ	H	L	LECZ	H	L	LECZ
17	Korba	L	L	NECZ	H	L	LECZ	H	H	MECZ	H	L	LECZ
18	Koria	H	H	MECZ	H	L	LECZ	H	L	LECZ	L	H	ECZ
19	Mahasamund	L	H	ECZ	L	L	NECZ	L	H	ECZ	L	L	NECZ
20	Mungeli	L	H	ECZ	L	H	ECZ	L	H	ECZ	L	H	ECZ
21	Narayanpur	H	H	MECZ	L	H	ECZ	H	H	LECZ	H	L	LECZ
22	Raigarh	H	L	LECZ	H	L	LECZ	H	L	LECZ	L	L	NECZ
23	Raipur	H	H	MECZ	H	H	MECZ	L	H	ECZ	H	L	LECZ
24	Rajnandgoan	L	L	NECZ	L	L	NECZ	L	L	NECZ	L	L	NECZ
25	Sukma	L	H	ECZ	L	H	ECZ	L	L	NECZ	L	H	ECZ
26	Surajpur	L	L	NECZ	H	H	MECZ	L	H	ECZ	L	L	NECZ
27	Surguja	H	L	LECZ	H	L	LECZ	H	H	MECZ	H	L	LECZ

Table 4 (a) Classification of Computed Valuation of Cropping Zone (2011-2018) of Onion, Cauliflower, Cabbage & Okra

S. NO.	2011-18	ONION		CAULIFLOWER		CABBAGE		OKRA	
districts name	RSI	RYI	RSI	RYI	RSI	RYI	RSI	RYI	
1	Balod	44.6	129.1	114.4	112.9	147.4	113.3	63.0	61.7
2	Balodabazar	50.5	55.3	60.8	110.1	42.5	111.8	51.5	117.9
3	Balrampur	159.2	90.9	62.5	91.1	72.2	87.2	106.9	80.1
4	Bemetara	49.4	123.0	100.8	111.2	116.5	107.6	81.1	78.3
5	Bijapur	80.0	57.1	5.8	66.0	14.7	53.1	27.6	83.4
6	Bilaspur	36.9	95.0	110.9	80.6	122.9	77.3	141.3	69.7
7	Dantewada	37.6	89.7	21.9	95.0	28.4	101.6	66.2	82.1
8	Dhamtari	77.1	93.4	70.5	79.1	76.0	76.1	105.9	140.4
9	Durg	209.5	123.7	419.2	113.8	471.0	107.9	256.7	90.4
10	Gariyaband	31.3	187.0	33.4	52.8	20.4	76.9	15.0	90.9
11	Jagdajpur	75.2	79.2	72.5	94.1	98.8	95.8	62.8	80.3
12	Janjgeer	63.7	112.4	61.2	119.5	66.6	119.2	78.6	84.1
13	Jashpur	41.5	98.4	25.6	93.5	31.4	94.8	24.4	88.0
14	Kabirdham	96.9	92.5	54.2	100.0	33.7	96.3	52.5	132.9
15	Kanker	141.3	114.0	96.7	89.7	73.6	88.8	92.1	87.1
16	Kondagoan	276.1	67.9	380.3	169.8	343.9	85.6	370.1	78.7
17	Korba	104.3	25.4	191.3	96.6	222.4	114.7	268.9	85.0
18	Koria	120.3	115.8	145.4	97.0	134.5	88.1	209.5	90.1
19	Mahasamund	126.2	96.9	51.1	84.4	72.7	84.1	50.2	90.7
20	Mungeli	41.1	103.9	43.5	154.6	46.8	206.8	44.8	177.3
21	Narayanpur	222.7	166.0	165.5	76.7	123.3	101.9	168.0	86.5
22	Raigarh	146.9	96.5	60.1	93.6	93.0	94.6	92.0	117.0
23	Raipur	308.1	105.7	199.8	102.0	145.3	101.3	231.3	91.0
24	Rajnandgoan	39.7	95.6	47.4	86.9	9.9	86.5	49.7	90.0
25	Sukma	16.0	97.2	5.2	154.6	6.4	157.0	22.9	123.5
26	Surajpur	190.5	93.2	175.4	84.0	137.6	90.6	98.5	119.5
27	Surguja	169.2	95.1	147.6	90.3	154.9	81.0	163.5	183.3

Table 4 (b) Classification of Cropping Zones (2011-2018) of Onion, Cauliflower, Cabbage &

Okra.

S. NO.	2011-18 districts name	ONION			CAULIFLOWER			CABBAGE			OKRA		
		RSI	RYI	Cropping Zone	RSI	RYI	Cropping Zone	RSI	RYI	Cropping Zone	RSI	RYI	Cropping Zone
1	Balod	L	H	ECZ	H	H	MECZ	H	H	MECZ	L	L	NECZ
2	Balodabazar	L	L	NECZ	L	H	ECZ	L	H	ECZ	L	H	ECZ
3	Balrampur	H	H	MECZ	L	L	NECZ	L	L	NECZ	H	L	LECZ
4	Bemetara	L	H	ECZ	H	H	MECZ	H	H	MECZ	L	L	NECZ
5	Bijapur	L	L	NECZ	L	L	NECZ	L	L	NECZ	L	L	NECZ
6	Bilaspur	L	L	NECZ	H	L	LECZ	H	L	LECZ	H	L	LECZ
7	Dantewada	L	L	NECZ	L	L	NECZ	L	H	ECZ	L	L	NECZ
8	Dhantari	L	L	NECZ	L	L	NECZ	L	L	NECZ	H	H	MECZ
9	Durg	H	H	MECZ	H	H	MECZ	H	H	MECZ	H	L	LECZ
10	Gariyaband	L	H	ECZ	L	L	NECZ	L	L	NECZ	L	L	NECZ
11	Jagdapur	L	L	NECZ	L	L	NECZ	L	L	NECZ	L	L	NECZ
12	Janjgeer	L	H	ECZ	L	H	ECZ	L	H	ECZ	L	L	NECZ
13	Jashpur	L	L	NECZ	L	L	NECZ	L	L	NECZ	L	L	NECZ
14	Kabirdham	L	L	NECZ	L	H	ECZ	L	L	NECZ	L	H	ECZ
15	Kanker	H	H	MECZ	L	L	NECZ	L	L	NECZ	L	L	NECZ
16	Kondagoan	H	L	LECZ	H	H	MECZ	H	L	LECZ	H	L	LECZ
17	Korba	H	L	LECZ	H	L	LECZ	H	H	MECZ	H	L	LECZ
18	Koria	H	H	MECZ	H	L	LECZ	H	L	LECZ	H	L	LECZ
19	Mahasamund	H	L	LECZ	L	L	NECZ	L	L	NECZ	L	L	NECZ
20	Mungeli	L	H	ECZ	L	H	ECZ	L	H	ECZ	L	H	ECZ
21	Narayanpur	H	H	MECZ	H	L	LECZ	H	H	MECZ	H	L	LECZ
22	Raigarh	H	L	LECZ	L	L	NECZ	L	L	NECZ	L	H	ECZ
23	Raipur	H	H	MECZ	H	H	MECZ	H	H	MECZ	H	L	LECZ
24	Rajnandgoan	L	L	NECZ	L	L	NECZ	L	L	NECZ	L	L	NECZ
25	Sukma	L	L	NECZ	L	H	ECZ	L	H	ECZ	L	H	ECZ
26	Surajpur	H	L	LECZ	H	L	LECZ	H	L	LECZ	L	H	ECZ
27	Surguja	H	L	LECZ	H	L	LECZ	H	L	LECZ	H	H	MECZ

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