Original Research Article

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

ABSTRACT

A study was carried out in the ~~department~~ Department of ~~vegetable~~ Vegetable ~~science~~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~~Chilli, Brinjal, Onion, Cauliflower, Cabbage ~~&~~ and Okra) for 6 years (2004-05 to 2010-11) & 8 years (2011-12 to 2018-19) were collected from the Directorate of Horticulture ~~&~~ and Farm Forestry, ~~(~~Department of Agriculture, Government of Chhattisgarh) ~~&~~and 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~~ conducted 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~~Chilli, Brinjal, Onion, Cauliflower, Cabbage ~~&~~ and Okra, respectively. Out of 18 districts, four, six, four, five, five, three, seven ~~&~~ and six districts were ~~falls~~ under efficient cropping zones (ECZ) for Tomato, Potato, ~~Chilly~~Chilli, Brinjal, Onion, Cauliflower, Cabbage ~~&~~ and 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~~Chilli, Brinjal, Onion, Cauliflower, Cabbage ~~&~~ and 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~~Chilli, Brinjal, Onion, Cauliflower, Cabbage ~~&~~ and Okra, respectively.

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

The outcome of analysis of long term data of area ~~&~~ and production of vegetable crops grown in different districts of Chhattisgarh indicated that the area and production of various vegetable crops ~~has~~ have 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 ~~&~~ and 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~~ Chilli contribute largely to the vegetable export basket. Inspite 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 areas which are suitable ~~to~~for growing vegetables ~~production~~ and ~~can~~ thereby we can increase the productivity of vegetables per unit area and time.

Efficient Cropping Zone~~s~~ (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.~~and Balasubramanian 2003).** The productivity level of each and every crop is varying from place to place and therefore, identification of efficient cropping

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zone will be helpful to prepare a strategic plan for optimum use of available resources ~~&~~ and 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 **(Thavaprakaash *et al.* 2008).**

MATERIAL AND METHOD

The data related to area, production and productivity of Tomato, Potato, Chilli~~y~~, Brinjal, Okra, Onion, Cauliflower ~~&~~ and Cabbage crops and total cultivable area in 18 districts of Chhattisgarh were collected for 2004–05 to 2010– 2011 (06 years) ~~&~~ and 27 districts of Chhattisgarh were collected for 2011-12 to 2018-19 (08 years) from the ~~directorate~~ Directorate of ~~horticulture~~Horticulture, Raipur Chhattisgarh and ~~directorate~~ Directorate of ~~economics~~ Economics and ~~statistics~~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

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

Where,

RSI: Relative Spread Index.

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

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 districts Durg, Mahasamund and Raigarh falls under Most Efficient Cropping Zones (MECZs). The districts Dantewada, Bastar, Kabirdham and Narayanpur were considered as a Efficient Cropping Zones (ECZs) were inwhere RSI Value was low & and RYI Value was high. Although the productivity of tomato in these districts was high but its spread is was low, so efforts should be made to increase the area of tomato crop. The districts Bilaspur, Janjgir, Jashpur, Korea, Raipur and Surguja comes under Less Efficient Cropping Zone (LECZs). Lastly, districts like Bijapur, Dhamtari, Kanker, Korba & and Rajnandgaon were reported Under the Not Efficient Cropping Zones (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 districts viz., Durg, Koria, Narayanpur & and Raipur were considered as Most Efficient Cropping Zones (MECZs) as both the values of RSI and RYI were high. Similarly, the districts Balod, Bemetara, Janjgir, Kabirdham, Mahasmund, Mungeli & and Sukma were considered as Efficient cropping zones (ECZs), whereas the districts Bilaspur, Jashpur, Kondagaon, Raigarh & and Surguja falls were under Less Efficient Cropping Zones (LECZs). The District districts Balodabazar, Balrampur, Bijapur, Dantewada, Dhamtari, Gariyaband, Jagdalpur, Kanker, Korba, Rajnandgaon, Surajpur were considered under Not Efficient CroppingZone (NECZs).

Table A - Shifting of district during study period I2004 -10 to 2011-18 for Tomato cultivation

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

It is clear from Table A, that districts Koria, Narayanpur &adRaipur emerged 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 districts Dantewada, Dhamtari, Durg, Jagdalpur, Kabirdham & and

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 six districts they are were Bijapur, Janjgir, Kanker, Mahasmund, Narayanpur & and Rajnandgaon fallwhich were s under Not Efficient Cropping Zone (NECZs) with both low RSI and RYI.

A close observation of table 3 (a) & (b) indicated that the districts Jashpur, Raipur & and 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 districts Dantewada, Durg, Jagdalpur, Janjgir, Balod, Bemetara, Kabirdham, Mungeli, Narayanpur & and 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 private sectors. Out of 27 Districts, 7seven Districtsdistricts, they areviz., Korba, Koriya, Balrampur, Bilaspur, Kondagaon, Raigarh a& nd Surguja were considered as Less Efficient Cropping Zone (LECZs). Lastly, the districts Balodabazar, Bijapur, Dhamtari, Gariyaband, Kanker, Mahasmund & and Rajnandgaon falls were 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 & and Surajpur
2.	ECZ	Dantewada, Dhamtari,Durg, Jagdalpur, Kabirdham & and Raipur.	Dantewada, Durg, Jagdalpur, Janjgir, Balod, Bemetara, Kabirdham, Mungeli,Narayanpur &and Sukma
3	LECZ	Bilaspur, Jashpur,Korba, Koriya & and Sarguja.	Korba, Koriya, Balrampur, Bilaspur, Kondagaon, Raigarh & and Surguja
4	NECZ	Bijapur, Janjgir, Kanker, Mahasmund,Narayanpur & and Rajnandgaon	Balodabazar, Bijapur,Dhamtari, Gariyaband, Kanker, Mahasmund & and Rajnandgaon

The— Ddistricts Jashpur, Raipur & and Surajpur emerged as Most Efficient Cropping Zone for potato cultivation during 2010-2018

Efficient Cropping Zone for ~~Chilly~~Chilli

It is quite clear from the table 1 (a) & 1 (b) that the outcome of analysis of 06 six years data (2004-2010) of area and production of chilly chilli crop revealed that districts Bilaspur, Kabirdham, Korba & and Surguja were considered as Most Efficient Cropping Zone (MECZs) because of

the high RSI ~~&~~ and RYI Value. Here high-tech production technology can be introduced to harness potential yield of the crop. The districts Bijapur, Dhamtari, Janjgir ~~&~~ and Kanker ~~falls~~ were under Efficient Cropping Zone (ECZs) with low RSI ~~&~~ and high RYI values. The districts Jashpur, Koriya, Narayanpur ~~&~~ and Raigarh were considered as Less Efficient Cropping Zone (LECZs) where the RSI value was high but ~~and~~ RYI value was low ~~values~~. Among 18 dist~~r~~icts Dantewada, Durg, Jagdalpur, Mahasamund, Raipur ~~&~~ and Rajnandgaon come~~s~~ under Not Efficient Cropping Zone (NECZs) whereboth RSI and RYI values ~~both~~ were below 100 per cent.

During the period of 2011-2018, the districts Kabirdham, Korba ~~&~~ and Surguja were reported as Most Efficient Cropping Zone (MECZs) which has high RSI and RYI value for ~~Chilly~~ Chilli cultivation. The districts Dhamtari, Balrampur, Jagdalpur, Kanker, Mahasmund, Mungeli, Raipur ~~&~~ and Surajpur were categorized under Efficient Cropping Zone (ECZs) with low RSI ~~&~~ and high RYI values which ~~indicates~~ indicated that in ~~this~~ these districts, area~~s~~ under ~~chilly~~ chilli cultivation is less but production is high. The outcome of 27 districts ~~reported t~~revealed that the~~,~~ districts Bilaspur, Durg, Koriya, Kondagaon, Narayanpur and Raigarh ~~falls~~fell under Less Efficient Cropping Zone (LECZs), while the districts Sukma, Gariyaband, Bemetara, Balod, Balodabazar, Bijapur, Dantewada, Janjgir, Jashpur ~~&~~ and 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~~ Chilli cultivation

S. N.	Category	Study Period I(2004 -10)	Study Period II(2010-18)
1	MECZ	Bilaspur, Kabirdham,Korba ~~&~~ and Surguja	Kabirdham, Korba ~~&~~and Surguja
2	ECZ	Bijapur, Dhamtari,Janjgir ~~&~~ and Kanker	Dhamtari, Balrampur,Jagdalpur, Kanker, Mahasmund, Mungeli, Raipur ~~&~~and Surajpur
3.	LECZ	Jashpur, Koriya,Narayanpur ~~&~~ and Raigarh	Bilaspur, Durg, Koriya, Kondagaon,Narayanpur and Raigarh
4.	NECZ	Mahasamund, Raipur ~~&~~ and Rajnandgaon	Sukma, Gariyaband, Bemetara, Balod, Balodabazar, Bijapur, Dantewada, Janjgir, Jashpur ~~&~~ and 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) indicate~~d~~s that the district~~s~~ Durg, Narayanpur ~~&~~ and Korba were categorized under Most Efficient Cropping Zone (MECZs) for Brinjal cultivation during the period of 2004-2010 (06 years) because of high RSI ~~&~~ and RYI Values. Out of 18 districts, ~~5~~ five districts ~~they are~~viz., Dantewada, Dhamtari, Jagdalpur, Mahasamund ~~&~~ and Raigarh, ~~falls~~ fell under Efficient Cropping Zone (ECZs) as RSI value ~~is~~ was low ~~&~~ and RYI value was high. The districts Kanker, Raipur ~~&~~ and Sarguja were considered as Less Efficient Cropping Zone (LECZs) because of high RSI ~~Values~~ values and low RYI ~~Values~~values. Out of 18 districts, ~~Seven~~ seven districts (Bijapur, Bilaspur, Janjgir, Jashpur, Kabirdham, Koriya ~~&~~ and Rajnandgaon) come~~s~~ 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~~ high RSI ~~&~~ and ~~High~~ high RYI values, therefore it is considered as Most efficient cropping zone (MECZs). Out of 27 districts, ~~7~~ seven districts Balod, Bemetara, Janjgir, Kabirdham, Koriya, Mungeli ~~&~~ and Sukma ~~exhibits~~ exhibited low RSI ~~&~~ and ~~High~~ high RYI values and were classified as Efficient Cropping Zone (ECZs). In contrast to this, ~~6~~ six districts viz., Surguja, Raipur, Narayanpur, Korba, Kondagaon ~~&~~ and 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 viz., Balodabazar, Balrampur, Bijapur, Dantewada, Dhamtari, Gariyaband, Jagdalpur, Jashpur, Kanker, Mahasmund, Raigarh, Surajpur ~~&~~ and Rajnandgaon ~~falls~~ fell 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 ~~&~~ and Korba	Durg
2.	ECZ	Dantewada, Dhamtari,Jagdalpur, Mahasamund ~~&~~ and Raigarh	Balod, Bemetara, Janjgir, Kabirdham,Koriya, Mungeli ~~&~~ and Sukma
3.	LECZ	Kanker, Raipur ~~&~~ and Sarguja	Surguja, Raipur, Naryanpur, Korba, Kondagaon ~~&~~ and Bilaspur.
4.	NECZ	Bijapur, Bilaspur, Janjgir, Jashpur, Kabirdham, Koriya ~~&~~and Rajnandgaon	Balodabazar, Balrampur, Bijapur, Dantewada, Dhamtari,Gariyaband, Jagdalpur, Jashpur, Kanker, Mahasmund, Raigarh, Surajpur ~~&~~ and Rajnandgaon

It is clear from the above Table D that there has been changes in most efficient cropping zone and Narayanpur & and Korba districts shifted from MECZ to LECZ while, only one district, Durg remained 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 revealed that the districts Dhamtari, Mahasmund, Raigarh & and Sarguja reported higher values of RSI and RYI and were considered under Most efficient cropping zone (MECZs). The districts Dantewada, Durg, Jagdalpur, Janjgir & and Raipur comes under Efficient Cropping Zone (ECZs) with low RSI & and 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 27of 27 districts, 3 three districts viz., Korba, Koriya and, Narayanpur were considered as Less Efficient Cropping Zone (LECZs). Among 27 districts, 6 six districts viz., Bijapur, Bilaspur, Jashpur, Kabirdham, Kanker & and Rajnandgaon were categorized under Not Efficient Cropping Zone (NECZs).

The perusal of table 4 (a) & (b) indicates indicated that the districts Balrampur, Durg, Kanker, Koriya, Narayanpur & and Raipur falls fell under Most Efficient Cropping Zone (MECZs) because of high RSI and RYI values. Out of 27 districts, 5 five districts they areviz., Balod, Bemetara, Gariyaband, Janjgir & and Mungeli comes under Efficient Cropping Zone (ECZs) because its RSI value was low and RYI Value was high. High Value of RSI & and low RYI Value obtained through analysis indicates indicated that the districts Kondagaon, Korba, Mahasamund, Raigarh, Surajpur and Surguja were considered as Less Efficient Cropping Zone (LECZs). Among 27 districts, 10 districts they areviz., Balodabazar, Bijapur, Bilaspur, Dantewada, Dhamtari, Jagdalpur, Jashpur, Kabirdham, Sukma & and Rajnandgaon wecategorized 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& and Sarguja	Balrampur, Durg, Kanker, Koriya, Narayanpur & and Raipur
2	ECZ	Dantewada, Durg, Jagdalpur, Janjgir &and Raipur	Balod, Bemetara, Gariyaband, Janjgir & and Mungeli
3	LECZ	Korba, Koriya,Narayanpur	Kondagaon, Korba, Mahasamund, Raigarh, Surajpur andSurguja

4	NECZ	Bijapur, Bilaspur, Jashpur, Kabirdham, Kanker & and Rajnandgaon	Balodabazar, Bijapur, Bilaspur, Dantewada, Dhamtari, Jagdalpur, Jashpur, Kabirdham, Sukma & and Rajnandgaon

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

Efficient Cropping Zone for Cauliflower

The results shown in table 2 (a) & (b) indicated that during 2004-2010, the districts Durg & and Narayanpur where high RSI & and RYI Value recorded was were considered as the Most Efficient Cropping Zone (MECZs). Out of 18 districts, 3 three districts Dhamtari, Kabirdham & and Raigarh wecategorized under Efficient Cropping Zone (ECZs) with low RSI values & and 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 & and low production, the districts Bijapur, Bilaspur, Dantewada, Jagdalpur, Janjgir, Jashpur, Mahasmund, Rajnandgaon and Sarguja falls fell under Not Efficient Cropping Zone (NECZs).

It is quite clear from the table 4 (a) & (b) that the districts Raipur, Kondagaon, Durg, Bemetara and, Balod were 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 five districts Balodabazar, Janjgeer, Kabirdham, Mungeli, Sukma falls under Efficient Cropping Zone (ECZs) with low RSI values & high RYI Values. Out of 27 districts, 6 six districts Bilaspur, Korba, Koriya, Narayanpur, Surajpur & and Surguja weredistrict categorized under Less Efficient Cropping Zone (LECZs) where the districts registered high RSI and low RYI values. Among 27 distircts, 11 distircts Balrampur, Bijapur, Dhamtari, Gariyaband, Kanker, Dantewada, Jagdalpur, Jashpur, Korba, Mahasamund, Raigarh & and Rajnandgaon comes under Not Efficient Cropping Zone (NECZs) where area & and 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 & and Narayanpur	Raipur, Kondagaon,Durg, Bemetara, Balod
2	ECZ	Dhamtari, Kabirdham& and	Balodabazar, Janjgeer,

		Raigarh	Kabirdham,Mungeli, Sukma
3	LECZ	Kanker, Korba, Koriya and Raipur	Bilaspur, Korba, Koriya, Narayanpur, Surajpur ~~&~~ and Surguja
4.	NECZ	Bijapur, Bilaspur, Dantewada, Jagdalpur, Janjgir, Jashpur, Mahasmund,Rajnandgaon and Sarguja	Balrampur, Bijapur, Dhamtari, Kanker, Gariyaband, Dantewada, Jagdalpur, Jashpur, Korba, Mahasamund,Raigarh ~~&~~ and Rajnandgaon

Above table F ~~indicates~~ indicated that ~~District~~ districts Raipur, Kondagaon, Durg, Bemetara~~,~~ and Balod were 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) indicate~~ds~~ that the district Durg, Korba, Narayanpur ~~&~~ and Raigarh ~~falls~~ fell under Most efficient cropping zone (MECZs) because of high value of RSI ~~&~~ and RYI during 2004-2010. Out of 18 districts, ~~7~~ seven districts Dantewada, Dhamtari, Jagdalpur, Kabirdham, Kanker, Mahasmund ~~&~~ and Sarguja ~~exhibits~~ exhibited low area under cabbage cultivation with high production ~~was~~ and were classified as Efficient Cropping Zone (ECZs). In contrast to this, ~~2~~ two districts viz., Bilaspur~~,~~ and Koriya ~~,~~ where area under Cabbage cultivation was more but the production was low were~~,~~ categorized under Less Efficient Cropping Zone (LECZs). Among 18 districts, ~~5~~ five districts Bijapur, Janjgir, Jashpur, Raipur ~~&~~ and Rajnandgaon were 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) indicated that six districts viz., Balod, Bemetara, Durg, Korba, Narayanpur~~,~~ and Raipur~~,~~ were considered as Most Efficient Cropping Zone (MECZs), mainly because of ~~Higher~~ higher value registered for RSI ~~&~~ and RYI. Among 27 districts, ~~5~~ five districts viz., Balodabazar, Dantewada, Janjgir, Mungeli ~~&~~ and Sukma were categorized under Efficient Cropping Zone (ECZs) with low RSI and ~~High~~ high RYI values. Under Less Efficient Cropping Zone (LECZs), most of the districts come~~s~~ because for high area and low yield. ~~they are~~These districts are Bilaspur, Kondagaon, ~~Koria~~ Korya Surajpur ~~&~~ and Surguja. Out of 27 districts, 11 districts (Balrampur, Bijapur, Dhamtari, Gariyaband, Janjgir, Jagdalpur, Jashpur, Kanker, Mahasamund, Raigarh ~~&~~ and Rajnandgaon) ~~falls~~ fell under Not Efficient Cropping Zone (NECZs) with both low RSI and RYI values.

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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 & and Raigarh	Balod, Bemetara, Durg,Korba, Narayanpur and , Raipur.
2	ECZ	Dantewada, Dhamtari, Jagdalpur, Kabirdham, Kanker, Mahasmund & and Sarguja	Balodabazar, Dantewada, Janjgir, Mungeli & and Sukma
3	LECZ	Bilaspur , and Koriya,	Bilaspur, Kondagaon,Koria, Surajpur & and Surguja
4.	NECZ	Bijapur, Janjgir, Jashpur, Raipur & and Rajnandgaon	Balrampur, Bijapur, Dhamtari, Kabirdham, Gariyaband, Janjgir, Jagdalpur, Jashpur, Kanker, Mahasmund, Raigarh & and Rajnandgaon

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It is quite clear from the above Table G that for profitable cultivation of cabbage, the districts viz., Balod, Bemetara, Durg, Korba, Narayanpur and Raipur were 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 indicated that out of 18 districts, two Districts districts viz., Durg & and Korba were considered as Most Efficient Cropping Zone (MECZs) because the RSI and RYI values were high. The districts Bijapur, Dantewada, Dhamtari, Jagdalpur, Kabirdham & and Raigarh were categorized under Efficient Cropping Zone (ECZs) as its RSI Value was low and RYI was high. Out of 18 districts, 5 frive districts viz., Kanker, Koriya, Narayanpur, Raipur & and Surguja were considered as Less Efficient Cropping Zone (LECZs) because of high RSI & and low RYI Values. The districts Bilaspur, Janjgir, Jashpur, Mahasmund , and Raigarh were Categorized under Not Efficient Cropping Zone (NECZs) because its RSI & and RYI Value were below 100%.

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

During 2010-2018, the districts Dhamatri ~~&~~ and Surguja were ~~indentify~~ indentified as a most efficient cropping zone for cultivation of okra crop~~s~~.

On the basis of coverage of area and status of productivity of respective crops, there ~~are~~ were 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~~ have been shown in this paper. In First category those districts ~~falls~~ fell where RSI ~~&~~ and RYI Values were high. ~~which required~~ In this zone, involvement of players of public ~~&~~ and private sectors ~~&~~ is required for use of advance high technology to increase production ~~&~~ and productivity per unit area ~~&~~ and time, including processing and value addition activities, ~~will provide~~ ensuring more production and good quality produce as well as high net returns. The districts belongs to 2nd category where the area of respective crop cultivation was comparatively low ~~&~~ and 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 ~~&~~ and inputs. The districts which ~~falls~~ fell under 4th category where 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~~ indicated 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)** who 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~~ chilli showed reduction in production over the years. They also revealed that the Nilgiris is the sole district ~~was falls~~which fell 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 that the district Virudhunagar has been the Most Efficient Cropping Zone (MECZ) for ~~chilly~~ chilli 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~~Nadu, ~~4~~ four districts (Tiruppur, Cuddalore, Ariyalu and Kanniyakumari) were categorized under Highly Inefficient Cropping Zone (HICZ) for potato crop. **Otung and** Aniekan~~Akpacti~~ **(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~~ revealed that ~~the,~~ only two states Ogun & Ondo ~~falls~~ fell 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 ~~&~~ and Yobe) were 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.

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

	2004-2010	TOMATO		POTATO		CHILLY		BRINJAL	
S. NO.	districts name	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 Chilli & and Brinjal

	2004-2010	TOMATO			POTATO			CHILLY			BRINJAL		
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	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 ~~&~~ and Okra

	2004-2010	ONION		CAULIFLOWER		CABBAGE		OKRA	
S. NO.	districts name	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	Mahasmund	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 & and 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	Mahasmund	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~~ Chilli ~~&~~and 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	Rajnandgoan	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~~ Chilli ~~&~~ and 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	Jagdalpur	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 ~~&~~ and Okra

	2011-18	ONION		CAULIFLOWER		CABBAGE		OKRA	
S. NO.	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	Jagdalpur	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 ~~&~~ and Okra.

	2011-18	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	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	Dhamtari	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	Jagdalpur	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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