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An Assessment Of Good Agriculture Practices For Sustainable Vegetable Production In Chhattisgarh State.

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Abstract- This study aims to generate evidence on a sustainable vegetable production model that will be key to regulating GAP in Chhattisgarh state. The vegetable production sector provides immediate income, nutrition, and food security and contributes significantly to the economy of India. In recent decades, the sustainability of the vegetable sector has been challenged due to the unsystematic use of agrochemicals for commercializing production. Adopting Good Agriculture Practices (GAP) could reduce the use of agrochemicals in commercial vegetable production. This study conducted the assessment of GAP in Bilaspur, Mungeli, and Janjgir- Champa districts. A mixed-method approach, combining quantitative and qualitative methods, was adopted for the study, which included farmers' surveys, key informant interviews, and in-depth interviews. The vegetable sector provides immediate income, nutrition, and food security and contributes significantly to the economy of Chhattisgarh. In recent decades, the sustainability of the vegetable sector has been challenged due to the unsystematic use of agrochemicals for commercializing production. Adopting Good Agriculture Practices (GAP) could reduce the use of agrochemicals in commercial vegetable production. The results showed that farmers were adopting different GAP, such as cropping practices, livestock integration, soil fertility management practices, and integrated pest management practices. Upon adopting these practices, farmers reduced agrochemicals' use by more than 40%. The study's findings imply that adopting GAP helps reduce the use of agrochemicals, consequently motivating farmers toward safe and sustainable vegetable production. The study recommends market-based solutions such as creating mass consumer awareness, ensuring premium prices with quality assurance mechanisms for making the GAP-based production profitable, and promoting its wider adoption. This is supported by facilitating farmers' access to government subsidies, price incentives, and insurance services and increasing access to GAP inputs.

Keyword- Sustainable growth, GAP, Profitable, Farmer.

Introduction- The sustainability of commercial vegetable production in Chhattisgarh is challenged due to unsystematic use the wrong amounts, compositions, and methods of agrochemicals in wrong locations of agrochemicals such as chemical fertilizers and pesticides, which negatively impacts the livelihood of smallholder farmers. The unsystematic use of chemicals causes both production decline and ecological deterioration, soil degradation, and microbial depletion, resulting in multiple adverse effect. To prevent the unsystematic use of agrochemicals, safe food production through using Good Agriculture Practices (GAP) is increasingly gaining attention globally.

sssss The study was conducted in Bilaspur, Mungeli, and Janjgir-Champa districts of Chhattisgarh state of India. A sample of 220 vegetable farmers were selected randomly form 11 villages from the selected blocks. The pre-tested interview schedule was used for collection of data and the data was analysed by using appropriate statistical methods such as percentage (%), mean and standard deviation.

Result and Discussion- Socioeconomic status (SES) is a combined measurement of a person's or group's economic and social position in society. It plays a significant role in determining one's access to common resources, livelihood pattern, household food & nutritional security, and so on. (Roy et al., 2013; Behera et al. 2020) [11,3]. In this present study, the various variables representing socio- economic profile of the vegetable Growers of Bilaspur, Mungeli, and Janjgir-Champa districts. The data pertaining to age of respondents has been analysed and categorized into three categories (Table 1). Table 1 clearly indicated that the majority of the respondents of the Bilaspur (65.45%), Mungeli (55.45%) and Janjgir- Champa (64.54%) fit into middle-aged category. As a result, it could be stated that decisions regarding farming practises in the study area were expected to be heavily influenced by middle and elderly farmers.

Table:1 Distribution of respondents according to their age (n=220).

Age	Bilaspur (n=220) Frequency/Percentages		Mungeli (n=220) Frequency/Percentages		Janjgir- Champa (n=220) Frequency/ Percentages	
Young (≤ 30)years	34	15.45%	32	14.54%	40	18.18%
Middle aged (30 to 50) years	144	65.45%	122	55.45%	142	64.54%
Old aged (≥50) years	42	19.09%	66	30%	38	17.27%
	Mean-	73.33	Mean-	73.33	Mean-	73.33
	SD-	61.3297	SD-	45.445	SD-	59.475

Operational land holding- The respondents were classified into three Categories (Small, Medium, Large) according to their operational holdings as shown in table 5. Data clearly indicated that Majority of the respondents of Bilaspur (63.6%), Mungeli (76.3%), and in Janjgir- Champa (78.1%) had small land holding. In Bilaspur around 35.45% of respondents were in medium land holding category followed by 0.9% of respondents who were having large land holding. Likewise, In Mungeli district, around (22.7%) of respondents were in medium land holding category followed by 0.9% of respondents who were having large land holding. In Janjgir- Champa District, around 19.0% of respondents were in medium land holding category followed by 2.7% of respondents who were having large land holding. This landholding distribution corresponds to the general trends in the state and possible region.

Table 5: Distribution of respondents according to their Operational land holding. (n=220)

Land Holding	Bilaspur (n=220) Frequency/Percentages		Mungeli (n=220) Frequency/Percentages		Janjgir-Champa (n=220) Frequency/Percentages	
Small (up to 2.5 acre)	140	63.6%	168	76.3%	172	78.1%
Middle (2.5- 5.0 acre)	78	35.45%	50	22.7%	42	19.0%
Large (5.0 acre and above)	2	0.9%	2	0.9%	6	2.7%
	Mean=73.33	SD=69.11	Mean=73.33	SD=85.42	Mean=73.33	SD=87.32

Occupation- An outlook from the table 6 inferred that, around half of the respondents (46.36%) from Bilaspur district were following agriculture as main Occupation followed by (21.8%) respondents who follows agriculture along with labour, 20% respondent who have Agriculture and Animal Husbandry as main occupation. Similarly, In Mungeli District, majority of the respondents (52.27%) have Agriculture as main occupation; followed by (23.6%) and (14.5%) respondents, who have main occupation agriculture with labour, and Agriculture with Animal Husbandry, respectively. In Janjgir-Champa district of Chhattisgarh, majority of the respondents (48.18%) have agriculture as the main occupation, followed by (26.36%) and (19.09%) respondents, who have main occupation agriculture with labour, and Agriculture with Animal Husbandry, respectively.

Table-6 Distribution of respondents according to their Occupation

Category	Bilaspur (n=220) Frequency/Percentages		Mungeli (n=220) Frequency/Percentages		Janjgir-Champa (n=220) Frequency/Percentages	
Agriculture	102	46.36%	115	52.27%	106	48.18%
Agriculture + Labour	48	21.8%	52	23.6%	58	26.36%
Agriculture + Annual husbandry	44	20%	32	14.5%	42	19.09%
Agriculture +cast-based occupation	20	9%	12	5.4%	6	2.7%
Agriculture +Business	6	2.72%	9	4%	8	3.6%
	Mean=44	SD=36.74	Mean= 44	SD=43.29	Mean=44	SD=41.18

Sources of irrigation- Different sources of Irrigation for respondents in their vicinity for vegetable are being shown in result in table 7. The result shown in table 7 states that Majority of the respondents (83.6%) from Bilaspur district were having one source of Irrigation followed by two source of Irrigation (16.36%). Whereas, In Mungeli district majority of the respondents (87.2%) had one source of irrigation followed by two source (12.7%). In Janjgir-Champa, district, majority of the respondents (95.4%) had one source for irrigation for their vegetable followed by two source (4.5%).

Table 7: Distribution of respondents according to their sources of irrigation. (n=220).

Irrigation sources	Bilaspur (n=220) Frequency/Percentages		Mungeli (n=220) Frequency/Percentages		Janjgir-Champa (n=220) Frequency/Percentages	
One source	184	83.6%	192	87.2%	210	95.4%
Two source	36	16.36%	28	12.7%	10	4.5%
	Mean=110	SD=104.6	Mean=110	SD=115.9	Mean=110	SD=141.4

Vegetable Farming Experience- The data in table 8 revealed that majority (47.72 %) of the respondents of Bilaspur, district had medium level of vegetable farming experience followed by (33.18%) and (19.09%), who had lower and higher level of farming experience, respectively. Whereas majority (54.54%) of the vegetable growers of Mungeli, district had medium level of Vegetable farming experience followed by (30.90%) and (14.54%) of them had lower and higher level of farming experience, respectively. Majority (56.36 %) of the vegetable growers of Janjgir-Champa, district had medium level of Vegetable farming experience followed by (28.18%) and (15.45%) of them had lower and higher level of farming experience, respectively.

Table 8: Distribution of respondents according to the Vegetable farming experience.

Category	Bilaspur (n=220) Frequency/Percentages		Mungeli (n=220) Frequency/Percentages		Janjgir-Champa (n=220) Frequency/Percentages	
Low (≤ 15)years	73	33.18%	68	30.90%	62	28.18%
Medium (15-25 years)	105	47.72%	120	54.54%	124	56.36%
High (25 and above)	42	19.09%	32	14.54%	34	15.45%
	Mean=73.33	SD=31.501	Mean=73.33	SD=44.24	Mean=73.33	SD=46.05

Exposure of Training- Table 9 shows respondent's exposure to training. Result shown in table 9 states that majority of respondents (95.4%), who were trained in Bilaspur district and (96%) respondents in Mungeli district and 98.1% of respondents in Janjgir- Champa district.

Table-9 Distribution of respondents according to their Exposure to training. (n=220)

Training duration	Bilaspur (n=220) Frequency/Percentages		Mungeli (n=220) Frequency/Percentages		Janjgir-Champa (n=220) Frequency/Percentages	
Untrained	10	4.5%	8	3.6%	4	1.8%
trained	210	95.4%	212	96%	216	98.1%
	Mean=110	SD=141.4	Mean=110	SD=144.2	Mean=110	SD=149.9

Social Participation- Data portrayed in table-10 states that majority of the respondent (73.6%) from Bilaspur, (70.4%) from Mungeli district and (74.54 %) from Janjgir- Champa district had two organisation participation in different social institutions like SHGs, FPOs, Cooperative, Farmers Club.

Table-10 Distribution of respondents according to their Social Participation (n=220)

Organisations	Bilaspur (n=220) Frequency/Percentages		Mungeli (n=220) Frequency/Percentages		Janjgir-Champa (n=220) Frequency/Percentages	
One organisation	42	19.09%	38	17.27%	41	18.6%
Two organisations	162	73.6%	155	70.4%	164	74.54%
Two and more organisations	16	7.2%	27	12.2%	15	6.8%
	Mean=73.33	SD=77.8	Mean=73.33	SD=70.93	Mean=73.33	SD=79.5

Annual income- Data presented in Table 11 states that In Bilaspur, Mungeli, and Janjgir-Champa districts, majority of the respondents (73.6%, 81.8%, and 87.2%, respectively) had medium level of Annual Income.

Table-11 Distribution of respondents according to their Annual income (In rupees). (n=220).

category	Bilaspur (n=220) Frequency/Percentages		Mungeli (n=220) Frequency/Percentages		Janjgir-Champa (n=220) Frequency/Percentages	
Low (50,000 per year)	40	18.1%	28	12.72%	18	8.1%
Middle (50,000-1,50,000 per year)	162	73.6%	180	81.8%	192	87.2%
High (1,50,000-5,00000 per year)	18	8.1%	12	5.4%	10	4.5%
	Mean=73.33	SD=77.57	Mean=73.33	SD=92.72	Mean=73.33	SD=102.84

Cast- It was found that (73.6%) of vegetable farmers belonged to OBC caste category followed by SC (18.1%) and General (7.2%) and only (0.9%) respondent was found from ST category in Bilaspur district. In Mungeli district (69%) of vegetable farmers belong to OBC category Followed by SC (20.9%) and General (8%) and only (1.8%) respondent was found from ST category. In Janjgir-Champa district (68.1%) of vegetable farmers belong to OBC category Followed by SC (19%) and General (9%) and only (3.6%) respondent was found from ST category.

Table-12 Distribution of respondents according to their cast. (n=220)

Cast	Bilaspur (n=220) Frequency/Percentages		Mungeli (n=220) Frequency/Percentages		Janjgir-Champa (n=220) Frequency/Percentages	
ST	02	0.9%	04	1.8%	08	3.6%
SC	40	18.1%	46	20.9%	42	19%
OBC	162	73.6%	152	69%	150	68.1%
GENERAL	16	7.2%	18	8.1%	20	9%
	Mean-55	SD=73.03	Mean=55	SD=66.98	Mean=55	SD=64.87

Conclusion- This study reveals that majority of the respondents were middle-aged farmer, were having Upper primary level of education with nuclear family, mixed housing pattern, and following agriculture as the main occupation. It was found that most of the respondents were small Farmer. It was found that majority of the respondents were having medium level of annual income, Vegetable Farming Experience, Social Participation, Information seeking Behaviour, Farm Decision Making, Innovativeness, Risk orientation, etc. The policymakers should keep this socioeconomic status in mind while formulating any strategies to improve the socioeconomic condition of the vegetable growers of Chhattisgarh.

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