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"Knowledge of farmers towards climate smart soil moisture conservation techniques"

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Abstract

Climate Smart Agriculture (CSA) avoids the lose-lose situation by integrating climate smart practices with agriculture strategies. The term was coined by the UN Food and Agriculture Organization (FAO) in 2010. CSA promises to transform agricultural systems which will decrease global food insecurity and reduce poverty. CSA practices can raise farm productivity while mitigating climate change.

Indian agriculture is traditionally a system of rainfed agriculture. Out of 141 million hectares of net cropped area, about 72 per cent is rainfed production and about 45 per cent of food grains and 75 - 80 per cent of pulses and oil - seeds and a number of important industrial crops are produced in their endangered ecosystem. Considering the present rate of development of irrigation facilities and also water potentiality of the country, experts estimate that at any point of time 50 per cent of cropped area in India will remain under rainfed farming. Such vast areas as of now consume hardly 25 per cent of total fertilizer consumption of the country. Due to poor level of management, crop productivity is also very low resulting in socio - economic backwardness of the people.

There is generally sufficient moisture require to plant growth during rainy season. Although, it may not necessarily be at the right time of the growing season to always achieve maximum yields and high quality crops. Additional moisture can be provided by supplemental irrigation, but producers can also greatly benefit by conserving soil moisture. This factsheet will therefore provide some fundamental information on practices to reduce water loss through conservation techniques.

Better management of soil moisture, i.e. green water management, is essential in achieving higher yields from rainfed agriculture. Soil moisture is often the most unreliable and scarce resource, so the challenge is to enhance the availability and productivity of water for biomass production. There are several ways to enhance soil

moisture availability, conservation tillage, mulching and compost use, in-field water conservation and improving overall soil moisture by avoiding deep drainage.

The study is expected to give clear understanding of the benefits of adopting of climate smart soil moisture conservation techniques and the constraints faced by the respondents in the adoption. The suggestions given by the respondents are also documented. Thus, the study is useful to the extension workers, scientists, administrators, planners and various non-governmental organizations. Hence the study would bring out the profile variations of knowledge among farmers, which could be very helpful for the planners and administrators to up scaling the technology in dry land farming.

Keywords: Climate Smart Agronomic Practices (CSAP), Integrated Pest Management (IPM), Natural Resource Management (NRM), Managerial ability of farmers and random sampling method, Neem seed kernel extract (NSKE), Soil And Water Conservation Practices (SWCP).

MATERIAL AND METHODS

Ex-post facto research design was adopted in the present investigation. Gulbarga district of Karnataka state was selected purposively. The study was conducted in 6 selected villages from 3 mandals of Gulbarga district, which included 20 respondents from each of the selected village. A sample of 120 respondents was selected for the study.

RESULTS AND DISCUSSION

I. Overall knowledge of respondents about climate smart soil moisture conservation techniques

It could be observed from the Table 1 and Fig. 1. Revealed that, majority (53.33 %) of the respondents belonged to medium knowledge about climate smart soil moisture conservation techniques followed by low knowledge (25.00 %) and high knowledge (21.67 %) category.

Table 1. Overall knowledge of respondents about climate smart soil moisture conservation techniques.

Sl. No.	Category	Frequency	Per cent
1.	Low (Mean – 0.425*SD)	30	25.00
2.	Medium (Mean ±0.425*SD)	64	53.33
3.	High (Mean + 0.425*SD)	26	21.67
		Mean = 16.75	SD =4.65

II. Individual techniques wise knowledge about climate smart soil moisture conservation techniques

The data regarding the knowledge of individual climate smart soil moisture conservation techniques is presented in Table 2.

Sand mulching

With regard to sand mulching, cent per cent (100.00 %) of respondents had the complete knowledge about sand mulching and it reduces soil erosion followed by facilitate infiltration rate (96.70 %) and conserve soil moisture for longer period (95.00 %).

Plastic mulching

In case of plastic mulching, it was observed that, nearly two third (63.30 %) of the respondents possessed the knowledge about plastic mulching followed by it helps suppress weed growth (63.30 %) and helps soil moisture retention (62.50 %). More than one third (36.70 %) of respondents didn't possess knowledge about plastic mulching.

Broad bed and furrow.

It was found that, majority (90.00 %) of the respondents didn't possess knowledge about broad bed and furrow. Only (10.00 %) of the respondents had knowledge about broad bed and furrows.

Contour cultivation

It was observed that, more than fifty (77.50 %) of the respondents had knowledge about contour cultivation followed by reduces the cost of cultivation (55.00 %),increases crop yield (43.33 %) and soil erosion and conserves soil moisture (40.00 %).

Vegetative barriers

It was noticed that, nearly ninety (86.70 %) of the respondents possessed the knowledge about vegetative barriers followed by it is effective in reducing soil erosion and conserving moisture (85.00 %), most viable means of moisture conservation (83.30 %) and vegetative barriers provide nitrogen rich green biomass, fodder and fuel (74.20 %).

Compartment bunding

It was observed that, majority (93.30 %) of the respondent's didn't possess knowledge about compartment bunding. Only (6.70 %) of the respondents possessed the knowledge that it conserve the rain water in-situ followed by reduces the runoff (6.70 %), soil & nutrient loses and it is a low cost in-situ moisture conservation practice (5.80 %).

Conservation furrow system

It was found that cent per cent (100.00 %) of respondent didn"t had knowledge about conservation furrow system.

Residue management and mulching

It was noticed that, more than three fourth (80.00 %) of the respondents possessed the knowledge of residue management and mulching followed it effective in soil moisture conservation (75.00 %), maintenance of soil organic matter (72.50 %) and residue management and mulching protect the soil from solar energy and reduces evaporation (61.70 %). Only (20.00 %) of the respondents didn't had knowledge about residue management and mulching.

Table 3. Individual techniques wise knowledge about climate smart soil moisture conservation techniques n=120

Sl. No.	Knowledge statements	Response			
		Yes		No	
		F	%	F	%
I.	**Sand mulching**				
1.	Do you know sand mulching	120	100.0	00	00.00
2.	Sand mulching prevent the soil erosion	120	100.0	00	00.00
3.	Sand mulching facilitate infiltration rate	116	96. 70	04	03.30
4.	Sand mulching conserve soil moisture for longer period	114	95.00	06	05.00
II.	**Plastic mulching**				
1.	Do you know plastic mulching	76	63.30	44	36.70
2.	Plastic mulching suppress weed growth	76	63.30	44	36.70
3.	Plastic mulching helps soil moisture retention	75	62.50	45	37.50
4.	Plastic mulching ensure faster germination	68	56.70	52	43.30
III.	**Broad bed and furrow**				
1.	Do you know broad bed and furrow	12	10.00	108	90.00
2.	Raised portion act as in - situ bund to conserve soil moisture	08	06.67	112	93.33
3.	Reduce the runoff and soil erosion	10	08.33	110	91.67
4.	Facilitate double cropping and increases crop yield	00	00.00	120	100.0
IV	**Contour cultivation**				
6.	Do you know contour cultivation	93	77.50	27	22.50
7.	Reduces soil erosion and conserve soil moisture	48	40.00	72	60.00
8.	Increases crop yield	52	43.33	48	56.67
9.	Reduces the cost of cultivation	66	55.00	34	45.00
V.	**Vegetative barriers**				
1.	Do you know vegetative barrier	104	86.70	16	13.30

2.	Effective in reducing soil erosion and conserving moisture	102	85.00	18	15.00
3.	Most viable means of moisture conservation	100	83.30	20	16.70
4.	Provide nitrogen rich green biomass, fodder and fuel	89	74.20	31	25.80
VI.	**Compartment bunding**				
1.	Do you know compartment bunding	08	6.70	112	93.30
2.	Conserve the rain water in situ	08	6.70	112	93.30
3.	Reduces the runoff, soil and nutrient loses	07	5.80	113	94.20
4.	It is a low cost in situ moisture conservation practice	07	5.80	113	94.20
VII.	**Conservation furrow system**				
1.	Do you know conservation furrow system	00	00.00	120	100.0
2.	Increases the soil moisture	00	00.00	120	100.0
3.	Reduces the runoff and soil loses	00	00.00	120	100.0
4.	Simple and low cost and increases the yield	00	00.00	120	100.0
VIII.	**Residue management and mulching**				
1.	Conservation residue management and mulching,	96	80.00	24	20.00
2.	Maintenance of soil organic matter	87	72.50	33	27.50
3.	Effective in soil moisture conservation	90	75.00	30	25.00
4.	Protect the soil from solar energy and reduces evaporation	74	61.70	46	38.30

III. Major findings of the study

It could be observed that overall knowledge of respondents about climate smart soil moisture conservation techniques, nearly more than fifty (53.33 %) of respondents belonged to medium knowledge about climate smart soil moisture conservation techniques followed by low knowledge (25.00 %) and high knowledge (21.67 %) category.

It was found that cent per cent (100.00 %) of respondents had knowledge about the sand mulching followed by vegetative barriers (86.70 %), residue management and mulching (80.00 %) and nearly two third (63.30 %) of the respondents possessed the knowledge of plastic mulching.

It was found that cent per cent of respondent didn‟t had knowledge of conservation furrow system followed by compartment bunding (93.30 %), broad bed and furrow (90.00 %) and contour cultivation (77.50 %) respectively.

It was revealed that, nearly half (46.67 %) of the respondents belonged to low adoption category about climate smart soil moisture conservation techniques followed by medium (33.33 %) and high (20.00 %) adoption category.

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