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AWARENESS AND KNOWLEDGE OF FARMERS ABOUT SOIL POLLUTION

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ABSTRACT

Indiscrimination use of cheapest canal irrigation water along with use of agro-chemicals deteriorating water and soil physio- chemical properties. Therefore, this investigation was conducted in Jaisamand command area, district-Udaipur, Rajasthan. One hundred fifty famers from 10 villages of left main canal and 75 farmers from 5 villages of right main canal were randomly selected. Standardized interview schedule was used to collect the desired information. Farmer's awareness and knowledge related to soil pollution were collected. The findings indicated that farmers had lack of information related to effect of excess irrigation water and judicious use of agro-chemicals on soil health.

INTRODUCTION

Awareness and knowledge of farmers of the command area plays an important role for optimum utilization of available natural resources. The easily available cheapest natural resource in the command area is irrigation water. The farmers are using this source as per their own knowledge and requirement causing much damage to physical and chemical characteristics of the soil. Unavailability of organic matter and indiscriminate use of agro-chemicals deteriorating the soil properties.

Intensive agriculture, increased quantity of synthetic materials such as pesticides and nutrients in synthetic form came into use resulting in chemical and soil pollution problems in the agricultural areas. Different kinds of poisonous chemicals are being used in agriculture these days, many of these chemicals are remain undegradable for years in soil and their concentration builds up geometrically as they are transferred to different stages of the food web. Therefore, the purpose of the present investigations was to examine the awareness and knowledge of fanmers about soil pollution.

RESEARCH METHODOLOGY

Jaisamand command area is providing irrigation water annually to 11,175 ha of land. The irrigation water has been supplied through two main canals i.e. Left Main Canal (LMC) and Right Main Canal (RMC). The length of LMC and RMC are 56.6 km and 25.0 km respectively. Ten villages along the LMC and five villages along RMC have been selected. A comprehensive list of farmers of each village was obtained from concurred Patwaries. Fifteen farmers from each village were selected with the help of random table. Like this 150 farmers from LMC and 75 farmers from RMC were selected. Thus, the sample comprised of 225 farmers for this study. Personal interview technique was adopted for collection of actual data.

RESULTS AND DISCUSSION

The results of Table 1 states that the major five aspects were categorized into three groups with the help of standard deviation ± mean i.e. Highly aware, Aware and Least aware. The first aspects related to the soil condition states that farmers were highly aware about the deterioration of soil physical properties in the presence of stubbles and stalks of maize, til and mustard. The farmers were aware that formation of bunds on sloppy fields improves the soil condition. Incase of soil management aspect farmers were highly aware about the practice of deep summer ploughing as it improves the soil condition whereas, they were least aware that soil salinity was due to heavy and frequent irrigation. Farmer's awareness related to irrigation management aspect states that they have comprehensive awareness for

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mortality of plants by water stagnation and these farmers have some awareness in rest of the irrigation management activities. The review of fertility management aspect states that farmers were highly aware about the quantity of nitrogenous fertilizer they were using in the crop is appropriate. Further they were highly aware about the use of PANA(tank bed soil) that improve soil properties. These farmers were aware that the agro- chemicals has bed effect on soil quality.

Table 1. Farmers Awareness about soil pollution activities

S. No.	Activities	LMC			RMC			Total		
		f	%	Rank	f	%	Rank	f	%	Rank
A.	Soil Condition									
1.	Stubbles and stalks of maize, sesame, mustard etc. deteriorates soil physical properties	147	98.00	A	75	100.00	H	22	98.66	H
2.	Formation of bunds on large sloppy fields improves soil condition	145	96.66	A	75	100.00	H	220	97.77	A
3.	Deep summer ploughing improves soil condition for plant growth	147	98.00	H	72	96.00	A	219	97.33	H
4.	Ploughing across the slope is the best technique for sloppy fields	139	92.66	A	74	98.66	A	213	94.66	A
5.	Ploughing after harvesting has relationship with soil productivity	ll7	78.00	A	68	90.66	A	185	82.22	A
6.	More tillage operations before Kharif and Rabi retards soil fertility and productivity	104	69.33	A	49	65.33	A	153	68.00	A
7.	Soil salinity is due to heavy and frequent irrigation with water logging	86	57.33	L	49	65.33	A	135	60.00	L
B.	Cropping System									
1.	Terrace farming is not required in this area	74	49.33	A	29	38.66	A	103	45.77	A
2..	Strip cultivation is not possible in this area.	55	36.66	A	16	21.33	A	71	31.55	A
C.	Irrigation Management									
1.	Water logging condition decreases plant population	131	87.33	H	73	97.33	H	204	90.66	H
2.	Irrigation on sloppy field deteriorates its quality	123	82.00	A	68	90.66	A	191	84.88	A
3.	Canal irrigation water is responsible or heavy and more	126	84.00	A	65	86.66	A	191	84.88	A
4.	Heavy and frequent irrigation decrease physio-chemical properties of soil	115	76.66	L	68	90.66	A	183	81.33	A
D.	Fertilizer Management									
1.	Applying adequate nitrogenous fertilizer in each crop	147	98.00	A	75	100.00	11	222	98.66	H
2.	Applying adequate phosphatic fertilizer in each crop.	116	77.33	A	61	81.33	A	177	79.55	A
3.	Apply potassic fertilizer in each crop	0	0.00		0	0.00		0	0.00	
4.	Nitrogenous fertilizer gives healthy plant growth	131	87.33	A	65	86.66	A	196	87.11	A
5.	Phosphatic fertilizer gives bold seed and better yield	117	78.00	A	38	50.66	A	155	68.RB	A
6.	Potasic fertilizer improves plant growth & yield	0	00.00		0	00.00		0	00.00	
7.	Manuring gives better yield	131	87.33	A	73	97.33	A	204	90.66	A
8.	Regular soil analysis gives tile soil fertility status	132	88.00	A	72	96.00	A	204	90.66	A
9.	Well fertile soil gives good yield.	128	85.33	A	72	96.00	A	200	88.88	A
10.	Application of P ANA improves soil properties	147	98.00	H	71	94.66	A	218	96.88	A
11.	Well manured soil is spongy, holds more water and shows good cop health	27	84.66	A	71	94.66	A	198	88.00	A
12.	Partially decomposed FYM is good for crop growth..	129	86.00	A	69	92.00	A	198	88.00	A
13.	Soil flora and fauna has no relation with its productivity.	108	72.00	A	63	84.00	A	171	76.00	A
14.	Post harvest animal grazing on crop residue increases soil productivity	120	80.00	A	60	80.00	A	180	80.00	A

S. No.	Activities	LMC			RMC			Total		
		f	%	Rank	f	%	Rank	f	%	Rank
15.	Your soil can grow all regional crops	137	91.33	A	69	92.00	A	206	91.55	A
16	Good number of soil flora and fauna is the symptom of well fertile soil.	114	76.00	A	35	46.66	A	149	66.22	A
17.	Bacterial inoculated seed improves yield.	101	67.33	A	24	32.00	L	125	55.55	L
18.	Agro-Chemicals affect the soil quality	49	32.66	L	21	28.00	L	70	31.11	L
E.	Environment:									
1.	Burning of crop residue deteriorates the local environment	61	40.66	A	1111	14.66	A	72	32.00	A
2.	Tree cutting from farm boundary deteriorates the micro environment local area	65	43.33	A	21	28.00	A	86	38.77	A

H=Highly aware, A=Aware, L=Least aware

Farmer's awareness related to environmental pollution was also recorded that which states farmers of the command area had some awareness related to cutting of trees from farm boundaries as this practice deteriorates the micro environment of local area. These farmers were also aware that crop residue must not be burn but composted for future use.

Farmers' knowledge about soil pollution

During the course of investigation, farmers have expressed their knowledge related to various agricultural practices, which changes the status of the soil. An overview of Table 2 shows that the collected responses for each aspect have been categorized into three groups i.e. Highly knowledgeable, Knowledgeable and Least knowledgeable on the basis of standard deviation ± mean. The first aspect related to soil condition reveals that farmer knows about the presence of stubbles and stalks of maize, til, mustered etc. in the field as they create problem in field preparation and also invite problem throughout the year. Formation of bunds in sloppy fields improves soil condition. The soil management aspect reveals that the farmers of the command area knows the importance of keeping the field fellow in summer with 2-3 deep ploughing for kharif maize. As this practice gives bumper crop of maize but these framers have not realized the micro-flora and fauna that gets killed with excessive tillage operations during the kharif and rabi.

In the case of fertility management aspect farmers have understood the use of PANA (tank bed soil) for betterment of soil physio- chemical properties. At the same time, they have least knowledge about the importance of soil flora and fauna and bed effect of agro - chemicals on such biological factors on fertility and productivity of soil. These farmers possessed average knowledge about the activities of crop management and environmental pollution aspects.

Table 2. Farmer's knowledge about soil pollution activities

S. No.	Activities	LMC			RMC			Total		
		F	%	Rank	F	%	Rank	F	%	Rank
A.	**Soil Condition**									
1.	Stubble & stalks of maize, til, mustard etc creates problems in land preparation and other hazards	147	98.00	K	75	100.00	H	222	98.66	K
2.	Bunds on sloppy land checks soil & nutrient losses	141	94.00	K	73	97.33	K	214	95.11	K
B	**Soil Management**									
1	Deep summer ploughing kills insects pest & weed seed	143	95.33	H	70	93.00	H	213	94.66	H
2	Ploughing across the slope reduces nutrient & soil run off	123	82.00	K	71	94.66	H	194	86.22	K
3	Ploughing after harvesting improves soil physio-chemical properties	87	58.00	K	41	54.66	K	128	56.88	K
4	Presence of calcium carbonate layer in sub soil and heavy irrigation salinity	86	57.33	K	45	60.00	K	131	58.22	K

S. No.	Activities	LMC			RMC			Total		
		F	%	Rank	F	%	Rank	F	%	Rank
5	Excessive tillage operation during pre-kharif & rabi kills soil micro flora & fauna	72	48.00	L	32	42.66	K	104	46.22	L
C	**Cropping System**									
1	Terrace farming reduces slope hence checks the rapid movement of water, soil & nutrients	71	47.33	K	22	29.33	K	93	41.33	K
2	Strip cultivation checks movement of soil particles & nutrients	44	29.33	k	15	20.00	k	59	26.22	k
D	**Fertility Management**									
1	Fertilizers have following results on crops-									
a	Nitrogenous fertilizers-healthy plant & seed	139	92.66	k	73	97.33	k	212	94.22	k
c	Phosphatic Fertilizers- bold seed & better yield	117	78.00	K	26	34.66	K	143	63.55	K
d	Potassic fertilizers – Harmone stimulants	0.	0.00	-	0	0.00	-	0	0.00	-
2	Application of PANA improves soil physio-chemical properties	129	86.00	K	69	92.00	H	198	88.0	H
3	Application of partially decomposed FYM invites weed and insect pests	120	81.00	K	65	86.00	K	185	82.22	K
4	Manuring improves soil water holding capacity, porosity environment for soil microbial activity	125	83.33	K	60	80.00	K	185	82.22	K
5	Post harvest animal grazing in the field decreases organic matter content of the soil	106	70.66	A	56	74.66	A	162	74.00	K
6	All regional crops, vegetables and fruits can be grown in deep soils.	94	62.66	A	61	81.33	A	155	68.88	K
7	A well fertile soil is composed of ample amount of soil micro flora. florafauna	107	68.00	A	32	42.66	A	134	59.55	L
8	Adoption of bacteria inoculated seed is eco-friendly practice.	86	57.33	A	19	25.33	A	105	46.66	L
9	Strong Agro-chemicals can eliminate soil flora & fauna .	13	08.66	L	7	9.33	L	20	8.88	L
10	Better population of soil flora and fauna can be maintained.	17	11.33	L	0	0.00	-	17	7.55	-
E	**Crop Management**									
1.	Crop protection maintains sustainable soil fertility and productivity.	77	48.00	A	27	36.00	A	99	44.20	K
2	Mono-cropping exhaust particular soil nutrients, invites insect-pest hazards.	17	11.33	A	8	10.66	A	25	11.11	K
F	**Environment**									
1.	Crop residue must not be burnt but composted for Manuring	65	43.33	A	21	28.00	A	86	38.22	K
2	Tree cutting from farm boundaries need to be checked.	40	26.66	A	32	42.66	A	72	32.00	K

H- Highly Knowledgeable, K- Knowledgeable, L- Least Knowledgeable

CONCLUSION

Farmers of the command area were lest aware about the main cause of soil salinity and dead animal carcasses pollutes ground water whereas, they had least information about irrigation water management and reasons of ground water pollutions.

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