

## KNOWLEDGE AND ADOPTION OF RECOMMENDED SOIL RECLAMATION PRACTICES FOR SALT AFFECTED SOILS BY THE FARMERS IN PURNA VALLEY

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### ABSTRACT

The study entitled “Knowledge and adoption of land care techniques by the farmers in salt affected track of Purna Valley” was purposefully conducted in Akola and Akot *Panchayat Samities* of Akola district in the Vidarbha region. For the present study, 100 farmers were selected from ten villages by using random sampling. The main objective of the study to know knowledge and adoption of recommended soil reclamation practices for salt affected soil and constraints in adoption of them by using exploratory design of social research. As regards the dependent variables majority of the respondents (65.00%) had a medium level of knowledge followed by 21.00 per cent of respondents found low level and 14.00 per cent of respondents had high level knowledge about recommended soil reclamation practice for salt affected soil. While considering the adoption maximum number of respondents (57.00%) had low levels of adoption followed by 31.00 per cent possessed medium and 12.00 percent respondent had a high level of adoption of recommended soil reclamation practice for salt affected soil.

**KEYWORDS:** Knowledge, Adoption, Soil Reclamation Practices, Land Care Techniques by the Farmers

### INTRODUCTION

Soil, water and sunlight are three basic resources of the nation. Soil is the most important gift of the nation. It could have been impossible for us to stand, live and eat if there was no soil, but a much smaller number of people realizes a great national importance of conserving and carefully utilizing the greatest gift of god. Fertile soil is a source of human subsistence and security. The prosperity of a country and its people essentially depends on the soil and water through on the proper use and treatment of soil. It is quite clearly known that fertile land in India gets deteriorated and demolished due to erosion, water logging, alkalinity, acidity, salinity, unscientific cropping patterns and cultivation techniques, improper irrigation, poor drainage system and deforestation.

In India, out of 187.7 m ha area about 148.9, 13.4, 13.8 and 11.6 mha degradation is confined to water, wind and chemical and physical processes respectively. The salinity / sodification is a chemical deterioration mainly observed in arid and semiarid region due to unscientific use of irrigation water, use of poor quality water for irrigation, inadequate drainage seepage from irrigation channels and increase in the level of ground water. It may also be due geological reasoning, especially observed in the Purna Valley Vidarbha region (Sagare *et al.* 2000)

The per capita availability of land in India decreased from 0.48 m ha 1951 to 0.15m ha in 2000 and is likely to reduce further to 0.08 m ha in 2020 because of demographic pressure. Besides reduction in land quantity there also declines in land quality what we call land degradation, either quantitatively or both as a result of plant nutrients, depletion of soil structure, desertification and pollution.

The major degradation problem on Maharashtra is water erosion, which may be ascribed to erratic and high intensity rainfall, undulation and steeply sloping land and from illdrained nature of soil. However, chemical deterioration to depletion of nutrients is mostly in Konkan and Western ghat due to soil salinity and sodicity is mainly restricted command area of various rivers, coastal area of Konkan due to increase sea water and part of Akola, Amravati and Buldhana district in Purna *Valley* a part of Vidarbha region in which salinity solidly developed geologically.

## MATERIALS AND METHODS

The study was conducted in Akola and Akot *Panchayat Samities* of Akola district in Vidarbha Region of Maharashtra state where farmers facing the problem of salinity and sodicity with the exploratory research design of social research.

The list of villages selected for the present study is Mhaisang, Palsobadhe, Babhulgaon, Borgaon, Katepurna, Dhamni, Gopalkhed, Nirat, Gandhigram, Vairat. From these selected 10 villages 100 farmers were selected by using random sampling method.

## MEASUREMENT OF KNOWLEDGE

English, and English (1961) defined knowledge as a body of understanding information by an individual farmer.

Operationally knowledge has been defined as the body of understanding information, possessed by respondents about land care techniques of salt affected soil of Purna *Valley*. A teacher made knowledge test was developed to measure the knowledge of an individual respondent about the various land care techniques and the responses of the respondents were taken on two point continuum i.e. yes/no and numerical score of 1 and 0 was assigned respectively.

$$\text{Knowledge Index} = \frac{\text{Actual knowledge score obtained}}{\text{Maximum Obtainable Knowledge score}} \times 100$$

The respondents were categorized according to obtained a knowledge index score with equal interval method as low (Up to 33.33), medium (33.34 to 66.66) and high (Above 66.66) level of knowledge of land care techniques.

## MEASUREMENT OF ADOPTION

Rogers (1983) defined adoption as the decision to make full use of innovation as the best course of action available. Adoption is operationally defined as the degree of acceptance and use of the land care practices by the respondents. The objective type question was advocated on identifying land care practices for salt affected soils. The response of the responses was elicited on three point continuum full adoption, partial adoption and non adoption with a score of 2, 1 and 0 assigned respectively.

$$\text{Adoption Index} = \frac{\text{Actual Adoption Score Obtained}}{\text{Maximum Obtainable Adoption Score}} \times 100$$

Obtained adoption raw score was converted into an adoption index by using following formula and the respondents were categorized into three categories, i.e. low, medium and high on the basis of overall adoption index of the equal interval method as low (Up to 33.33), medium (33.34 to 66.66) and high (Above 66.66) level of adoption of land care techniques.

## RESULTS AND DISCUSSION

### Farmers, according to Knowledge and Adoption of Land Care Techniques

#### Knowledge of the Farmers

The result of distribution of the farmers according to their level of knowledge about recommended soil reclamation practices for salt affected soil was ascertained and results are presented in Table-1 as below

**Table 1: Distribution of the respondents according to their level of knowledge**

Sr. No.	Knowledge level	Respondents (n=100)	
		Frequency	Percentage
1	Low	21	21.00
2	Medium	65	65.00
3	High	14	14.00
	<b>Total</b>	<b>100</b>	<b>100.00</b>

It could observe from Table-1 that near about two third (65.00%) of the respondents had a medium level of knowledge about the recommended soil reclamation practices for salt affected soil, whereas 21.00 per cent and 14.00 per cent of the respondent farmers were having low and high of knowledge about the recommended soil reclamation practices for salt affected soil respectively.

Therefore, it was inferred that, majority of the respondent farmers had a medium level of knowledge about the recommended soil reclamation practices for salt affected soil in the study area. The practice wise knowledge possessed by the respondents about soil reclamation practices for salt affected soils in Purna Valley was ascertained and the results are reveal that cent percent (100.00%) of the respondents had knowledge about soil reclamation practices like deep ploughing of land at every year or alternate year, followed by provision of farm ponds in a micro water shade (87.00%), major and micro nutrients should be applied on the basis of soil testing analysis (86.00%), incorporation of gypsum at the rate of 2.5 tons per ha in a combination with FYM 5 tons (84.00%), and cultivation of salt tolerant crops at suitable spacing with application of gypsum and FYM (79.00%).

**Table 2: Distribution of the Respondents according to their Knowledge about Recommended Soil Reclamation Practices for Salt Affected Soil**

Sr. No.	Name of Practices	Knowledge	
		Yes	%
1	Deep ploughing at every year or alternate years is necessary to increase the permeability of soil and to reduce surface runoff and losses of soil nutrients.	100	100.00
2	Incorporation of Gypsum @50% G.R.ie.2.5 t/ ha in combination of FYM 5 tones is necessary to increase productivity.	84	84.00
3	Major and micro nutrients should be applied on the basis of soil test analysis.	86	86.00
4	Application of Zinc sulphate 10-50 kg depending on the zinc status of soil.	21	21.00
5	Deep furrows after 2 or 3 rows of crops should be opened after 30 days of sowing to enhance efficiency of amendments and fertilizers.	06	06.00
6	Provision of farm ponds in a micro watershed should be made to conserve the excess water and to reduce the salinity or sodicity from the adjacent area.	87	87.00
7	The field boundaries should be demarcated with Vetiver bunds or the strip of natural grass so that damaging velocity of runoff water can be reduced.	22	22.00

Sr. No.	Name of Practices	Knowledge	
		Yes	%
8	Cultivate the salt tolerant crops at suitable spacing with application of gypsum and FYM.	79	79.00
9	It is recommended to pass the alkali water through gypsum bed having 30 cm thickness before irrigation to avoid its deleterious effect on soil property.	02	02.00
10	While planting the salt tolerant trees the pits (60X60X60) at the suitable spacing should be excavated and should be filled with gypsum @ 3 kg and FYM @ 10 kg/pit. and surface soil.	37	37.00
11	Green manuring with <i>Dhaincha</i> / Sun hemp be undertaken for amelioration of salt affected soil.	00	00.00

It is however to note that, majority of respondent farmers had no knowledge about green manuring with *Dhaincha* / Sun hemp for amelioration of salt affected soil (100.00%), followed by passing alkali water through gypsum bed having 30 cm thickness before irrigation (98.00%), deep furrows after two or three rows of crop should be opened after 30 days (94.00%), field boundaries should be demarked with Vetiver bund (78.00%), application of zinc sulphate (79.00%), planting of salt tolerant trees in pits which are filled with gypsum at the rate of 3 kg and FYM at the rate 10.00 kg per pit (63.00%).

Thus, it could be inferred that the majority of the respondent farmers had knowledge of recommended soil reclamation practices like deep ploughing of land at every year or alternate year, provision of farm ponds in the micro water, shade, application of major and micro nutrients, incorporation of gypsum and FYM, cultivation of salt tolerant crops at suitable spacing with the application of gypsum and FYM.

The majority of respondents found unaware about green manuring with *Dhaincha* / Sunhemp, passing of alkali water through gypsum bed, demarcation of field boundaries with Vetiever bunds, and application of zinc sulphate and plating of salt tolerant trees. The probable reasons for no knowledge about these practices may be that these practices are somewhat technical, which cannot be understood easily by the farmer.

Equipping the farmers with the requisite knowledge about various recommended practices in salt affected areas through organizing farmer training and arranging guidance campaigning may provide useful information in this regards. Imparting skilled training of reclamation of saline and sodic soil will also be useful. A simple literature, illustrations, figures and diagrams will also provide useful in creating awareness among farmers about reclamation of salt affected soil.

The findings of the present study are corroborating to the findings of Anonymous (1994). Similar types of finding were observed by Kadam et.al. (2000). Khedkar and Ingle (1994), Sagare et. al. (2000) Waghmare and Ingle (2001)

### Adoption

Adoption is the decision making process and important to the farmers in receiving maximum production of crops. Looking into the importance of adoption, respondent's adoption about recommended cultivation practices has been studied and the data in this regard have been presented in Table-3 as below.

**Table 3: Distribution of the Respondents according to their Adoption Level**

Sr. No.	Adoption level	Respondents (n=100)	
		Frequency	Percentage
1	Low	57	57.00
2	Medium	31	31.00
3	High	12	12.00
	<b>Total</b>	<b>100</b>	<b>100.00</b>

It was observed from Table.3 that most of the respondents (57.00%) had low levels of adoption of recommended soil reclamation practices for salt affected tract of Purna Valley. The 31.00 per cent of respondents having a medium level of adoption, whereas only 12.00 per cent of the respondents were having a high level of adoption.

Thus, it can be inferred that most of the respondents were grouped in low levels of adoption about soil reclamation practices for salt affected tract of Purna Valley. The distribution of the respondent according to practice wise adoption has been studied and the results were shows that majority of respondents had fully adopted the soil reclamation practices like deep ploughing at every year or alternate year (77.00%), incorporation of gypsum at the rate 2.5 tons per ha in combination of FYM (43.00%) and application of major and micro nutrients (47.00%). On the other hand majority of the respondents partially adopted soil reclamation practices like provision of farm ponds in a macro water, shade (68.00%), cultivation of salt tolerant crops with the application of gypsum and FYM (45.00%). It is however surprised to note that majority of the respondent had not adopted green manuring with *Dhaincha* / Sunhemp (100.00%), followed passing of alkali water through gypsum bed (98.00%), deep furrows after two or three rows of crops should be opened after thirty days (94.00%), plantation of salt tolerant trees in a pit (83.00%), demarcation of field boundaries with Vetiever bunds (83.00%), and application of zinc sulphate (79.00%) as soil reclamation practices for saline -sodic soils. This indicates that in study area there is vast scope for motivating the farmers for adoption of soil reclamation practices of saline-sodic soil thorough demonstrations and arranging exposure visits and conveying them to put the practices in actual use.

**Table 4: Distribution of the Respondents according to their Adoption of Recommended Soil Reclamation Practices for Salt Affected Soil**

Sr. No.	Name of Practice	Adoption		
		Full	Partial	Not
1	Deep ploughing at every year or alternate years is necessary to increase the permeability of soil and to reduce surface runoff and losses of soil nutrients.	77	23	00
2	Incorporation of Gypsum @50% G.R.ie.2.5 t/ ha in combination of FYM 5 tones is necessary to increase productivity.	43	11	46
3	Major and micro nutrients should be applied on the basis of soil test analysis.	47	28	25
4	Application of Zinc sulphate 10-50 kg depending on the zinc status of soil.	09	12	79
5	Deep furrows after 2 or 3 rows of crops should be opened after 30 days of sowing to enhance efficiency of amendments and fertilizers.	02	04	94
6	Provision of farm ponds in a micro watershed should be made to conserve the excess water and to reduce the salinity or sodicity from the adjacent area.	12	68	20
7	The field boundaries should be demarcated with Vetiver bunds or the strip of natural grass so that damaging velocity of runoff water can be reduced.	04	13	83
8	Cultivate the salt tolerant crops at suitable spacing with application of gypsum and FYM.	40	45	15

Sr. No.	Name of Practice	Adoption		
		Full	Partial	Not
9	It is recommended to pass the alkali water through gypsum bed having 30 cm thickness before irrigation to avoid its deleterious effect on soil property.	01	01	98
10	While planting the salt tolerant trees the pits (60X60X60) at the suitable spacing should be excavated and should be filled with gypsum @ 3 kg and FYM @ 10 kg/pit. and surface soil.	00	17	83
11	Green manuring with <i>Dhaincha</i> / Sun hemp be undertaken for amelioration of salt affected soil.	00	00	100

**Note:** No. of Respondents is 100 so Frequency is Equal to Percentage

The findings of the present study are corroborating to the findings of Anonymous (1994). Similar types of finding were observed by Dube et.al. (1989). Khedkar et.al. (1994), Kadam et.al. (2001), Kamble (2002). Kale et.al (2011)

## CONCLUSIONS

This study concluded that majority (65.00%) of the respondents had medium level of knowledge followed by 21.00 per cent of respondents found low level and 14.00 per cent of respondents had high level knowledge about recommended soil reclamation practice for salt affected soil. While considering the adoption majority of the respondent had not adopted green manuring with *Dhaincha* / Sunhemp (100.00%), followed passing of alkali water through gypsum bed (98.00%), deep furrows after two or three rows of crops should be opened after thirty days (94.00%), plantation of salt tolerant trees in a pit (83.00%), demarcation of field boundaries with Vetiever bunds (83.00%), and application of zinc sulphate (79.00%) as soil reclamation practices for saline -sodic soils. While computing the overall adoption maximum number of respondents (57.00%) had low level of adoption followed by 31.00 per cent possessed medium and 12.00 per cent respondent had high level of adoption of recommended soil reclamation practice for salt affected soil.

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