

Soil Salinity and the Livelihood Strategies of Small Farmers: A Case Study in Faisalabad District, Punjab, Pakistan

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ABSTRACT

This study was conducted to obtain an understanding of the impacts of salinity on the livelihood strategies of farmers and responses of farmers to various technologies available to cope with the salinity problem. The study was conducted in two villages of Tehsil Jaranwala. The study found that farmers were trying to handle salinity problem at their own level with traditional and costly methods. No new technologies were disseminated among the farmers. Strategies being adopted by the farmers include the application of gypsum and water, scratching of soil surface and tile drain. The other factors which were associated with salinity were the intensity of land use, income and the land fragmentation.

Key Words: Soil salinity; Small farmers; Livelihood strategies; Pakistan

INTRODUCTION

Salinity has emerged as one of the major factor responsible for low crop production in Pakistan. During the last many years, various agricultural regions have significantly lost their productivity due to soil salinity. This situation is very alarming especially for the Punjab region which is producing a major share of crops for the whole country (Khan, 1991; Looney, 1997). Additionally, Pakistani economy is heavily dependent on agriculture through the exports of agricultural goods and the dependence of textile sector upon cotton crop. According to an estimate, about 6.0 million hectares of agricultural land in Pakistan is affected by salinity causing an estimated 62% loss in agricultural incomes (Davidson & Ijaz, 1997).

The main factors that contribute towards salinity in the Punjab region are: crop husbandry techniques, cropping mixes, irrigation technology, and the geophysical properties of the sub-soil and soil. The problem has been addressed at various levels. At the farm level, farmers have adopted different strategies that include the scrapping surface salt, applying gypsum, and ultimately abandoning land as profits fall. Despite all these measures, the soil salinity has escalated. Discussion of salinity has also been undertaken at the National and Provincial levels of government with a range of solutions and partial solutions being identified and implemented (IWASRI, 1991). These include changing the management of irrigation flows, investment in the upgrading of irrigation channels, research to determine the specific constraints on water use, and more recently, the use of alternative crops such as Eucalyptus trees and Atriplex saltbush that have been successful in the reduction of salinity in other parts of the world (Davidson & Ijaz, 1997).

Not much has been done so far to explore the impact of salinity on the socio-economic conditions of small farmers. This paper specifically focuses on the impacts of

salinity on the farmers and their strategies to cope with the situation.

METHODOLOGY

The study was conducted in two villages in saline area of Tehsil Jaranwala. A total of 150 respondents (farmers) were interviewed by taking 75 randomly selected respondents from each village. Statistical techniques such as frequency distribution and correlation analysis were used to analysis the data. SPSS was used for this purpose.

Distribution of 150 farm households on the basis of landholding size was less than five acres (52%), five to 12.5 acres (31.3%) and over 12.5 acres (16.7%).

A well designed interviewing schedule was used to collect information from the farmers. Face to face interviews were conducted for this purpose.

RESULTS AND DISCUSSION

Non-Significant factors. A number of correlations were run to identify the variables which were or were not associated with the salinity. The variables with no relationship with the salinity were: (a) total land owned, (b) total land managed (c) educational level of the farmers (d) number of income sources (e) and frequency of interaction with extension agent.

Factors having significant relationship with salinity. The variables associated with salinity were: (a) intensity of production (b) location on the watercourse (c) total income (d) and land fragmentation (Table I).

Salinity and farming. The data indicated that farmers were aware of the salinity problem. However, they were helpless because of the intensity of the problem. It reflects that in spite of the awareness they were unable to cope fully with the problem. The factors which were found to have

Table I. Correlation matrix of selected variables

Variables	1	2	3	4	5	6
1. Total operated land	--					
2. Total salinity	.473	--				
3. Intensity of production	.712**	-.352**	--			
4. Location on the water course	.015	-.211**	.270	--		
5. Total income	.329**	-.019**	.715**	.517**	--	
6. Land fragmentation	-.003	-.210	-.971*	.362**	-.013	--

*p <.05 **p<.01

significant relationship with salinity, however, tell some story about it. It tells that location on the watercourse was a major determinant of salinity. It means that farmers were helpless as they were unable to change the location. Income was important as they were able to adopt technologies to handle salinity problem. Similarly land fragmentation appears to be a blessing for the farmers. It reduced their disability of having a single piece of land at a particular location on the watercourse.

Farmer strategies to salinity. Picture offered by data about the farmers' responses to salinity was not very encouraging. It indicated that no consistent strategy was adopted by the farmers to cope with the situation. There appears to be no significant patterning in farmers' responses to soil salinity. Farmers were obtaining additional lands that were more favourably located with minimal soil salinity and intensifying production of existent agricultural lands. Farmers also emphasized the need for a larger government action against the problem. For example, installing a good drainage system was unavoidable for successful and sustainable reclamation. The water table must be maintained at a level where re-salinisation can be maintained to a minimum. The strategies offered by farmers are given in Table II below.

Table II. Farmers' suggestions for reclamation of land

Suggestions for reclaiming land (n= 150)	
Laying of tile drain	19.8%
Installation of tube well	21.5%
Cleaning of drainage	11.2%
Tile drain, tube well and cleaning	9.1%
No opinion	38.4%

As Table II suggests, 38.4% farmers were unable to form any opinion. This is alarming. It may indicate that intensity of problem is too big that farmers are unable to visualize it fully. Table further indicates that two top measures suggested were the installation of tube well and tile drain. It is important to mention that both these measures require larger resources and small farmers may not be able to afford all that. So some government assistance must be required (Qureshi & Barrett-Lennard, 1998).

When asked to state measures to tackle the problem of soil salinity, all of the farmers stated that they preferred to apply gypsum and have an increase in the water supply (Table III). The above methods were both economically and

environmentally unsustainable. Farmers seem not to have any systematic understanding about the side effects of gypsum application on their soils. Similarly, land fragmentation was a good temporary solution but in broader terms it places limitations on the adoption of new technologies.

Table III. Farmer's strategies to reclaim saline lands (percentage)

Applied gypsum	37.5
Applied water	43.6
Applied gypsum and water	14.7
Tile drain	1.4
Tile drain and applied water	2.8
Total (n= 150)	100.0

CONCLUSIONS

Soil salinity has emerged as a problem which is not only reducing the agricultural productivity but is also putting far reaching impacts on the livelihood strategies of small farmers. Intensity of problem is large which has made it very difficult for the farmers to combat with the situation. The temporary solutions being adopted by the farmers seem to have adverse effects in the long run. These will not only put more pressure on the small farmers who are already at the cutting edge but will also spoil the soil and ultimately the whole agricultural set up. A joint action by government, NGO'S and the farmers is immediately required to control the situation.

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