

THESIS

IMPACT OF SCARP TRANSITION AND SUSTAINABILITY OF COMMUNITY  
TUBEWELLS IN SELECTED AREAS OF SCARP-I

Submitted by

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## ABSTRACT

### IMPACT OF SCARP TRANSITION AND SUSTAINABILITY OF COMMUNITY TUBEWELLS IN SELECTED AREAS OF SCARP-I

In present and past few decades much have been said, experimented and is being practiced throughout the world regarding the water user community participation for good and efficient water management. There is a trend of shifting resource management from public to private sector. In Pakistan, responsibility of groundwater development and management has been shifted completely from public sector to private sector in fresh groundwater areas of SCARP-I. Groundwater development and management is presently being carried out by farmers through private (individual) and community tubewells (Managed by Farmers' Organizations). The present study was carried out to study the sustainability of the community tubewells and to evaluate the impacts of SCARP Transition on water table depth behavior and quality of pumped water.

A questionnaire was prepared to study the said objectives. An intensive field research program was followed. The indicators used to study the sustainability of community tubewells were: engineering and technical aspect, organizational aspect, reliability, equity, manageability, financial viability, technical and / or social guidance and replicability. Farmers were asked about the water table trend and quality of their shallow PTWs / CTWs and closed deep Public tubewells (STWs). A matched pair t test was used to detect the trend in water table depth. Water table data for 76 observation points located in whole SCARP-I area was accumulated from SMO, WAPDA and statistical and hydrograph

analysis was done. To study the impact on water quality of the shift from deep public tubewells (STWs) to shallow PTWs / CTWs, a matched pair t test was applied.

In present study a general procedure was developed to evaluate the sustainability of WUAs and was applied to evaluate the sustainability of community tubewells in the study area. The results were not encouraging as equity, reliability, financial viability, formal meetings record keeping, external guidance, replicability, incentives and benefits and leadership role were rated as 'low' and conflict management capability of Fos managing CTWs, technical and engineering aspect of the system and environmental and non tangible impacts were rated as 'medium'. Hence community tubewells in the SCARP-I area were considered as Non Sustainable.

To study the water table trend, null hypothesis of no change in water table behavior was tested against the alternative hypothesis of rising water table trend or falling water table trend. The test was significant and thus null hypothesis of no change in water table trend was rejected and alternate hypothesis of rising trend in water table was accepted. It was further noted that the results of hydrograph analysis and farmers subjective view about the water table trend were same as that of the t test. Study of the impact on quality of the pumped water shows that there was no significant change in pumped groundwater quality due to shift from deep public STWs to Shallow PTWs and CTWs: as the t test was not significant for Hafizabad, Sangla Hill schemes the test was significant for Beranwal, Shahkot and Zafarwal Schemes, showing improvement in water quality.

Finally the research draws some conclusions and recommendations to help in the formulation and implementation of future groundwater development and management policies on sustainable basis.

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