# A QUALITATIVE APPROACH TO STUDY WATER MARKETS IN PAKISTAN

Altaf A. Abro[1]

## ABSTRACT

The government of Pakistan has recently introduced reforms to reduce the financial deficit of the country's irrigation sector. Reforms are expected to grant autonomy to irrigation agencies and transfer part of the management responsibilities to water users. Water markets are already functioning in the country, but are limited to tube-well or sub-surface water in two provinces only. Although the development of water markets is described as being efficient, little is known regarding the potential feasibility for and impact of such markets on small landholders. The government's public investment in large irrigation projects has already widened the gap between large and small landholders in terms of revenues and financial assets. It is feared that reforms will further allow for arrival of powerful landholders and businessmen from other regions that will steadily displace the small local agricultural producers.

Several studies have been conducted from a quantitative perspective, but no qualitative study has been conducted that may provide insight into the equity issues in regard to water markets. Therefore, a qualitative study is proposed to investigate the affects of water markets on small landholders in Pakistan and the markets' role in the distribution of the benefits of water resources among landholders across all categories.

## INTRODUCTION

Governments of Pakistan's proposed reforms are mainly aimed at reducing the financial deficit of the country's irrigation sector. Reforms are further expected to grant greater autonomy to irrigation agencies and transfer part of the management responsibilities to water users by establishing water users associations (WUAs) and Water Area Boards (WABs).

Pakistan's neo-liberal economic reforms introduced during the early 1990's sought change in the water sector by establishing a privatized water rights system, i.e., a water market. In other parts of the world water markets are characterized as efficient and successful. Gazmuri (1992) claims that the water policy applied in Chile, resulting from the adoption of the neo-liberal economic model during the early 1980, has fostered efficient agricultural use of water mostly because of

[1] Public Policy Ph.D. Student, University of Arkansas, Fayetteville, AR-72701, USA. Email:altafabro@hotmail.com

adequate pricing and uncoupled transferability of water and land. Nevertheless, studies like Gazmuri's have focused merely on its efficiency, while they have neglected the issues such as equity in water distribution.

Informal water markets are already functioning in Pakistan, but are limited. Farmers adapt their weekly roster of canal water turns, exchange partial and full turns, and sometimes sell or purchase their turns informally. However, there is no formal mechanism to facilitate such activities. Farmers also participate actively in tube-well water transactions. These transactions allow farmers to more closely match the water supply to crop water requirements and to improve water use efficiency.

Under specific conditions of canal water supply with a high degree of variability, high seepage losses, and poor quality groundwater, farmers participate actively in the sale and purchase of canal water; which is of course informal and some times considered as illegal. In some cases, all farmers of a given watercourse command area may sell or purchase canal water turns for a certain period of time (week or ten days) or even for a season. Tube-well water markets are common in Sindh and Punjab provinces, whereas in two other provinces tube-well markets are not well established because of the poor quality and quantity of the ground water.

The aim of the proposed study is to conduct a qualitative enquiry into the effects of water markets on small landholders in Pakistan and the markets' role in distribution of benefits of water resources among landholders across all categories. To understand the impact of water markets on small landholders, the study shall make use of qualitative methods. Expected results will contribute to formulizing government policies on water resources and agricultural development, and guidelines and recommendations to decision-makers for improving public policy on irrigation water systems[2], especially water policy that is sensitive to the needs of small landholders. Key activities include archival research, in-depth interviews and application of questionnaires, and dissemination of results.

## Problem

In the given socio-political situation and absence of strong public institutions in Pakistan, specific changes in the management of irrigation systems, i.e. a water market *per se* is viewed with a suspicious eye. Many fear that reforms will allow

[2] The modern irrigated agriculture system is understood here as an array of instruments, e.g., water markets, water pricing, public investment in irrigation infrastructure (reservoirs and the water distribution system), direct subsidies to farmers to build farm-level infrastructure and purchase of irrigation technology, technology transfer schemes, water rights tenure, as well as the physical network of dams and canals.

powerful businessmen from other regions to steadily displace the small and medium-sized local agricultural producers. Despite the existence of public policies and State subsidies to improve production conditions of existing agricultural stakeholders, differential access to these resources is observed and large-scale producers largely capture benefits. Consequently, small and medium-sized producers are removed from agriculture.

The State has traditionally supported the distribution of these resources, but most of the benefit is reaped by those who can invest in the subsurface waters. Because of the high costs associated to drilling and well construction, most of the local small landholders are marginalized and their access to the resource has been potentially limited. The proposed modern irrigated agriculture system that pertains to water markets and water pricing might further preclude the smallholder sector of the rural dwellers from enjoying the benefits of long-term public investments in the water sector.

Gazmuri et al. (1994) reported that some of the research considers water markets efficient as they allocate the resources to higher value activities[3]. According to them there is an undeniable economic improvement measurable through the increase of agricultural annual revenues, private investment, and manual labor demand. Nonetheless, efficient water markets and decreasing poverty indexes do not match in the (Chilean) region as there are significant proportions of rural dwellers in the area that have not yet been able to benefit from the market-oriented economy and their access to water is restricted and unclear. Hence, the existence of a water market, while assuring higher economic efficiencies in producing agricultural products, does not address the issue of poverty alleviation (ECLAC 1995, Dourojeanni and Jouravlev, 2001).

Though little literature on this subject is available on Pakistan on which an argument maybe based, it is assumed that imperfections in water markets and the government's subsidy programs will cause further deterioration of the rural livelihoods[4]. In Pakistan, although water management system is largely State owned and funded, and a water market does not exist to trade surface water legally, the major benefits of public investment are directed to the most powerful

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[3] Studies have largely focused on productivity factor, but have failed to address the impact of irrigation system and its implications on social and economic relationship structuring in irrigated zone of arid regions. Researchers have extensively written on the subject in the context of South and Central America.

[4] The governments of Pakistan's previous record-investment of multi-million dollars on dams and other water systems have not contributed to the reduction of rural poverty due to inequitable distribution of the resources and the benefits.

and large producers, while the local rural population is excluded from these benefits.

## Significance

Although water markets have been described as efficient under diverse socio-economic and hydrological conditions in other countries such as the United-States, Chile, India, and Australia, little is known regarding the potential feasibility and impact of such markets on small landholders in any of these situations. In Pakistan several studies along technical, institutional, economic and environmental impacts have been conducted. But, most of these studies are quantitative in nature and there is no information available that may give us insight into the equity issues in regard to water markets.

Generally, qualitative research can be characterized as an attempt to obtain an in-depth understanding of the meanings and 'definitions of the situation' presented by informants, rather than the production of a quantitative measurement of their characteristics or behavior. For qualitative researchers the subjective beliefs of the people being studied have explanatory primacy over the theoretical knowledge of the researcher. According to Jorgensen (1989) the researcher may have a theoretical interest in being there, but concepts and their relevance to the subject of study are important. Therefore, concepts used in qualitative study should remain open and subject to refinement and definition based on what the researcher is able to uncover and observe.

Moreover, proposed qualitative study on the subject is preferred as it will answer why, what and how questions better than any quantitative study. The following section states some of the questions that drive the research on water markets. It is not intended to down play the importance of quantitative study where solid data is available, but rather to approach the question by an in-depth study of the issues involved in water markets and their impact on resource poor farmers.

## Questions

From the above discussion it is evident that government's water policies do not automatically yield benefits to all farmers. On the contrary, the actions might displace farmers. Proposed water markets may create new problems, for example by disrupting existing local institutions for operation and maintenance of the irrigation infrastructure. The benefits of reforms may be small and may be misdirected to some groups who already are well off. The history of large scale irrigation projects has shown that results are often far below what was expected. In Pakistan construction of three big dams has helped the economy, but has created wide disparity in incomes. Based on personal experience and an extensive review of the literature, research will focus on the following main questions:

- How will water markets impact small landholders?

**Sub Questions**

- How will water markets distribute water resources among small, medium and large landholders?

- How do farmers perceive the change in water policy and its impact on agriculture and related livelihoods?

The questions tend to emphasize the need to ask whether, government's proposed course of action shall actually help farmers. This may help us to learn how to best make use of scarce resources and find alternate solutions to solve problems.

**Audience**

For any kind of research, quantitative or qualitative, it is advisable to identify the entities that in the end will utilize the research. Following are some of the major stakeholders in water resources management of Pakistan. It is anticipated that they will read, critique, provide feedback and utilize the findings of the proposed research.

The Water and Power Development Authority (WAPDA): WAPDA, created in 1958 as a semi-autonomous body is responsible for planning and execution of schemes pertaining to:

- Generation, transmission and distribution of power;
- Irrigation, water supply and drainage;
- Prevention of water-logging and reclamation of waterlogged and saline lands;
- Flood control;
- Inland navigation.

Provincial Irrigation and Drainage Authorities (PIDAs): The main responsibility of the PIDAs relates to the operation and maintenance of the irrigation, drainage and flood-control systems. Under the provision of the Irrigation and Drainage Act, the PID is responsible for on-farm use; however, in practice, their activities stop at the end of the watercourse (mogha) or tertiary level of water distribution. The Provincial Agriculture Departments: The Provincial Agriculture Departments (PADs) are mainly responsible for organizing input distribution, the extension service to farmers and - farm management. The PADs are responsible for the implementation of the government's on-farm water management programs. Farmers are responsible for operation and maintenance of watercourses and field canals.

The Indus River System Authority (IRSA): The Indus River System Authority (IRSA) provides continuing interaction and a resolution of any disputes among the four provinces on matters relating to sharing the Indus waters

Farmers: Farmers manage their operation and take care of their watercourses. Farmers often participate extensively in the management of large-scale systems. Provincial Irrigation and Drainage Authority is responsible for maintenance of infrastructure, though; few researchers noted that the farmers are actually interfering with the operation. Examples include enlarging outlets, taking water out of turn, or adjusting of the levels of gates and even channel beds (Chambers, 1989).

## Paradigm

For a qualitative study it is important to be grounded in a certain paradigm to seek direction and guidance while interpreting the data. Therefore, the post-positivist paradigm will be used , which states that-reality can be approximated but can never be fully apprehended. Post-positivists use disciplined research techniques such as "constant comparison" to make sure that empirical data not their impressions drives their findings (Hatch, 2002). This paradigm suits this kind of qualitative enquiry, since, the researcher will be constantly comparing farmers' responses across the categories (small, medium, and large landholders) and shall cross check them with the official responses.

Researchers using post-positivist paradigm are -interested in capturing participant perspectives but in a rigorously disciplined way (Hatch, 2002). The outcome or product is analytical generalization, description, patterns and grounded theory. When patterns are discovered, the researcher uses deductive processes to verify the strength of those patterns in overall data to arrive at some conclusion.

# RESEARCH DESIGN

## Sampling, Data Collection, And Data Analysis

Sampling: Qualitative research is generally based on non-probability and purposive sampling rather than probability or random approaches. Sampling decisions are made for the explicit purpose of obtaining the richest possible source of information to answer the research questions. Purposive sampling decisions influence not only the selection of participants but also settings, incidents, events, and activities for data collection.

The researcher needs to use purposive sampling for site selection. Choosing an appropriate site to study, and forging a relationship with its participant members, is a key issue for all qualitative studies. Site selection has consequences for validity and generalizability, and both can be maximized either by selecting a

'typical' site or else conducting a multi-site study. In this study, it is proposed to choose water courses that have all categories of farmers (small, medium, and large landholders). It will be appropriate to choose from the well known sites/watercourses to maximize the information collection, validity and generalizability of the study. Three watercourses that have common characteristics i.e. reasonable number of landholders from all three categories will be selected.

Farmers will be selected by stratified sampling choosing farmers from varied categories. However, a very small sample may be obviously unrepresentative. The claim to "objectivity" is more or less achieved if the target farmers are selected on the basis of reasonable and clearly stated criteria (categories). - Fifteen farmers will be selected across all three categories i.e. 9 small landholders as they are the main focus of the study, and 3 each from medium and large landholders' categories.

Data Collection Techniques: Data collection techniques that are commonly used in qualitative research are questionnaire survey and in-depth interviews. However, researchers should consider other (secondary) data sources such as journals, newspapers, books, video tapes (if available) and any other research material on the subject that may assist researchers with the current situation. Secondar sources will also be helpful historical analysis of water policies.

There will also be a structured questionnaire survey for farmers (sample-size of 15 farmers across all three categories). Each questionnaire should take no more than 40 minutes.

Nine in-depth interviews will be conducted with officials including federal minister for agriculture and rural development, chairman WAPDA, chairman IRSA, Director General PIDA, and other key officials. Researchers may conduct maximum nine in-depth interviews. Each interview should take less than one hour.

Data Analysis: Qualitative data analysis, unlike quantitative is not concerned with statistical analysis, but with analysis of themes and patterns in the data. Increasingly, qualitative researchers use computer software programs to assist with analysis of data. Qualitative research may produce a rich, thick description of the phenomenon being studied or a theory about the phenomenon. Qualitative research reports often contain direct quotes from participants that provide rich illustrations of the study themes. Qualitative research, unlike its quantitative counterpart, does not lend itself to empirical inference to a population as a whole; rather it allows the researcher to generalize to a theoretical understanding of the phenomenon being examined.

For this study purposes typological data analysis seems suitable. Typological data analysis helps divide the dataset into categories based on predetermined typologies and patterns. Typologies are generated by a theory, common sense, and/or research objectives (Hatch, 2002). Researcher will follow three steps in developing typologies 1) assess the collected materials and then seek out mutually exclusive categories, then. 2) make sure that all of the elements being classified have been accounted for, and 3) examine the categories and their contents and make theoretical meaningful appraisal.

## Trustworthiness

Trustworthiness is about being honest, telling the truth, keeping promises, and being loyal so that people can trust researchers. Researchers have moral obligation to do the right thing and they should demonstrate integrity and the moral courage to report what they discover and not twist the facts in order to serve their ends or please the government officials. There are several ways including triangulation, referential materials, peer debriefing, and member checks that can help researchers maintain the trustworthiness.

## Reliability And Generalizability

Reliability: The researcher may also make sure that instrument of investigation is fully tested and applied and during analysis outliers and extreme cases are discussed and are accounted for.

Generalization: Sample size employed in quantitative research is often small, thus it is not free from criticism when it comes to generalization of findings. In case of agriculture and irrigation research it is even more complex as research findings and its use may affect hundreds of thousands farmers and families. Therefore issue of generalization needs to be handled with care.

Generalization depends on rigor of analysis method and interpretation. In many respects, the way in which generalization is conceptualized in quantitative studies is alien to qualitative research. For the social researcher what matters most is gaining an in-depth understanding of the attitudes, beliefs and behavior of the people s/he studies; the assumption is that this worldview will be context specific, and that generalization to others will therefore be extremely limited. Similarly, social research starts from the assumption that society is in a constant state of flux, that the social world and our understanding of it are constantly changing, again limiting the value of generalization

Although qualitative research may question positivist or post-positivist assumptions about generalizability, both approaches aim to produce findings that have relevance beyond the immediate context of the study. Whilst the production of laws of behavior is eschewed, there remains an often almost hidden claim that

the behavior found in the study will shed some light on the behavior of others, even if this explanatory range is limited in time and space. As Janet Ward-Schofield (1993) has suggested this claim entails a re-conceptualization of generalizability in terms appropriate to qualitative research. She prefers the terms 'fittingness', 'comparability', or 'translatability', reflecting the process of detailed description of the content and context of a study, so that it can be generalized to examples that match it closely.

The use of 'thick description' to boost the generalizability of a qualitative study is important, but generalizability depends not just upon detailed description of a phenomenon, but on revealing the social relations that underpin it.

## Ethical Issues

There are two groups of respondents i.e. farmers and the key officials. From an ethical stand point the researcher is answerable to both. Before administering questionnaire survey to farmers s/he shall discuss with them objectives of the study. If possible researcher may hand out a hard copy stating the objectives of research to all farmers that maybe part of study. But the problem is literacy among farmers, especially small landholders is extremely low. However, the idea is to make it discuss the objectives of research upfront and eliminate any unfounded expectations that they might attach with the study – s/he shall make clear that this study is not going to save them (farmers) from displacement, heavy water charges or any other kind of taxes that government plans to impose upon them. However, research findings shall be presented to government and rest depends upon government to act or not to act.

With key officials -- one technique to cope with ethical issues is to circulate and discus draft report before finalization and publication. This has the effect of involving agency staff in the analysis itself. This may sometimes lead to some findings not being reported formally, or being rephrased in more diplomatic language. However if agency attention is drawn to important problems and ideas generated about possible solutions then the more fundamental applied goals may be achieved. Similarly some sensitive issues may only be discussed verbally, especially if they are beyond the official scope of the research. However as an applied research process this still functions to improve agency action. Such a participatory approach is likely to be much more productive than simply presenting a final report, which is easily ignored.

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