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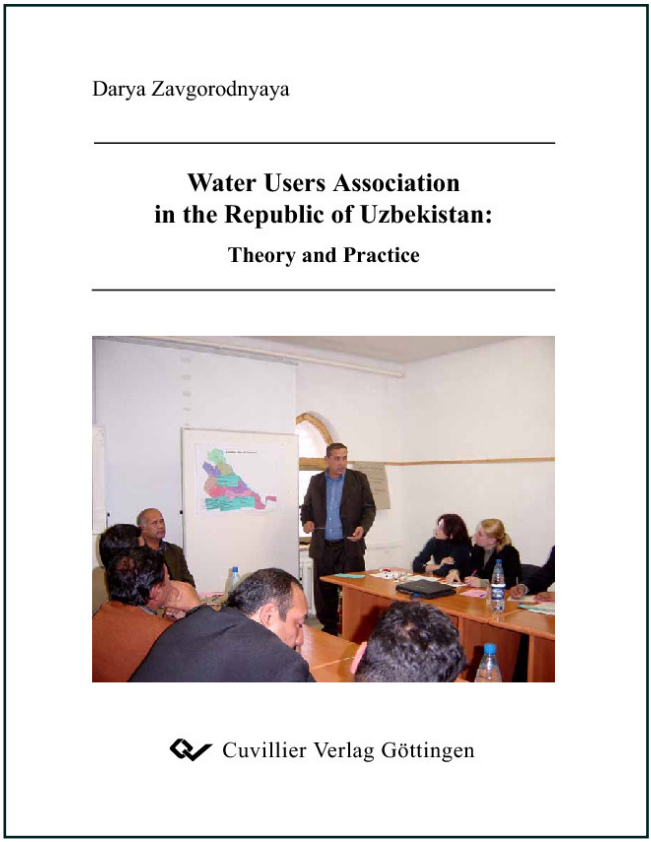
Water Users Associations in Uzbekistan: Theory and practice



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1 INTRODUCTION

From their first days of independence the countries of Central Asia began to reform land use and agriculture. As a result of these reforms, thousands of water users appeared on the regional level replacing the former *kolkhozes*[1] and *sovkhozes*[2]. Since the first reforms focused on the restructuring of land use, little was done to coordinate the reform processes between land and water sectors (ICWC, 2004, p. 34).This gap worsened the conditions of on-farm irrigation and drainage systems.

The economic reforms in the agricultural sector of the Republic of Uzbekistan started in 1992 and continue till today. These reforms address mainly organisational aspects of agricultural enterprises and deal to a lesser degree with macroeconomic aspects such as the liberalization of agricultural production and sales markets, and the establishment of water markets. Three types of agricultural enterprises were established: *shirkats*[3], *ferms*[4] and *dekhkans*[5]. However, the legislation on land property types such as private, public or semi-private has not been clarified till now (read more about the reforms in chapter 2).

The recent reforms in the agricultural sector in Uzbekistan have brought about many changes in the farmers' lives. Furthermore, local officials have also been struggling with the implementation of the reforms. The first changes took place under orders and legislative regulations from the Ministry of Agriculture and Water Resources (MAWR) as well as from the Cabinet. The changes in the agricultural sector occurred rapidly, including the adjustment and adaptation processes of *ferms*.

In sum, the governmental focus on reforms addressing land distribution, the worsened conditions of irrigation and drainage systems, as well as the lack of awareness by *fermers* for ongoing reforms in different sectors, motivated me to investigate the theoretical and practical pre-conditions of water management in Uzbekistan.

The reforms were the driving force for the establishment of a new organisation at the local level of water management in Uzbekistan. The Water Users Associations

[1] Collective farm in Soviet Union

[2] Soviet farm

[3] Collective farms

[4] Family farms

[5] Households

(WUAs) were established as a "bridge" between state irrigation management organisations and private (or semi-private in the case of Uzbekistan) water users.

So far there has been hardly any experience of WUAs in the Republic of Uzbekistan. The first WUAs were established in 2000. In some regions of the Republic international donors expanded their activities in the irrigation sector in the form of pilot projects, while in other regions the government supported the establishment of WUAs in place of unprofitable collective farms. The first WUAs did not have a sound legal basis and their establishment was legitimated only by Cabinet decrees and regulations. The question of the WUAs' legitimacy as a law was disputable and is still open. At the time of this study, there were only three WUAs with two or three years of experience in Khorezm. All the others were only founded in 2003. These circumstances did not allow the investigation of the performance of WUAs in the Khorezm region. Therefore the research focused on the perceptions of water users, officials and international donors.

The research was undertaken in the context of the ZEF[6]-UNESCO Project "Economic and ecological restructuring of land- and water use in the Region of Khorezm (Uzbekistan)" (Vlek et al, 2001; Vlek, 2003). In order to show how the present study is embedded in the project, it is essential to emphasize the project philosophy. The project is located in the Khorezm region of Uzbekistan. This region belongs to the lower Amudarya basin and is part of the Aral Sea basin. The inhabitants of Karakalpakstan[7] and Khorezm, suffer most from the accumulated effects of low water use efficiency, soil degradation and salinization in the basin, as well as from the economic and administrative legacies inherited from the Soviet era that are leading to poverty and poor health (Vlek et al, 2002). However, Khorezm, as a research area or region of international donors' support, has received little attention so far.

ZEF is carrying out an interdisciplinary, application-oriented research program with the aim of providing appropriate regional development concepts based on sustainable and efficient land and water use. The program started in 2001 and aims at integrating natural resource management, economic studies and studies of institutions in a philosophy of a long-term, participatory commitment to deliver de-centralized

[6] Zentrum für Entwicklungsforschung

[7] Autonomous Republic of Uzbekistan

development options based on a system where markets function and sound ecological principles are adhered to (Vlek, 2003).

In February 2004, project employees as well as Uzbek and western scientists met for the formulation of the second phase of the project. After intensive discussions, the project focus has been shifted to the direction of institutional analysis: legal framework, decision-making processes, and the attitude and strategies of *fermer*s. This shift was noticed in the project document "Project Phase II: Action Plan", Chapter 3 "Changes in the Activities in the four Research Areas", Subchapter 3.4. "Economy". The project document stresses: "Beyond modelling, a shift of research interest will be made towards "institutions". This analysis is needed to provide inputs for the on-going reform process in Uzbekistan" (Martius et al, 2004, p. 4). The current PhD topic is strongly based on the framework of attitude analysis of *fermer*s. In order to propose alternative restructuring concepts, one should gain the necessary understanding of natural, economic, and social processes.

This thesis has two goals:

1. Identify factors that influence success or failure of local water management (WUA) in Khorezm, Uzbekistan;
2. Discuss the role that pilot WUAs can play for real WUAs in Khorezm, Uzbekistan

The achievement of the first goal was enabled through and based on empirical analysis of WUAs in Khorezm as well as a theoretical framework that was created from different literature sources.

The collection of empirical data was guided by theories on irrigation management by Bruns (1999; 2003; 1998), Vermillion (2004; 1998; 1999), Cernea (1994), Meinzen-Dick (1999; 2002; 1995; 2002), the theoretical contribution to collective action by Olson (1965), Ostrom (1990; 1992), the theoretical framework on common-pool resources management by Ostrom (1992), Agrawal (2001; 2002). The academic contribution of the current thesis is the further theoretical-methodological development of interdisciplinary analysis applied to irrigation systems in Uzbekistan, with a focus on Khorezm Region, Uzbekistan.

Besides the political situation in terms of irrigation management reforms, which were developed during the last decade in Uzbekistan, and strengthened attention to WUAs, international donors play important roles in the processes of reforms.

The pilot WUAs in Uzbekistan created by international donors, have the character of an "island of salvation" (Chambers, 1988). Consequently, it is to be expected that the process of top-down creation of WUAs in Uzbekistan will show similar problems of not being embedded in local contexts. With these premises, the suitable components of pilot projects that are transferable to or advisable for real WUAs in Khorezm Region will be identified in this thesis.

The type of resource management systems that this thesis discusses is a large irrigation system inhabited by *fermers*. Research has been carried out on examples of four WUAs in the Region Khorezm and four pilot projects in two other Uzbek Regions: Syrdarya and Fergana Valley.

The average irrigated area of the investigated "normal" unsupported WUAs was 2400 ha. The average number of these WUA members was 143 irrigators. In Khorezm, two WUA types exist: one based on administrative-territorial and the other on hydrographical principles. WUAs of both types were selected for the investigation. This allowed the collection of different opinions and perceptions regarding the functioning of WUAs. Furthermore, it was essential to see first hand how different or similar WUAs are and which advantages or disadvantages the different establishment principles brought.

Following the derived goals of research, this PhD thesis includes two levels of field investigation. The first is the regional level for which the field research was carried out in Khorezm region. The second level consists of the pilot projects of international donors. The cases were selected in Syrdarya and the Fergana Valley.

The study was based on qualitative approaches. Semi-structured interviews were conducted in Khorezm with officials and persons who were in some way related to WUAs and irrigation management. In addition, a standardized questionnaire was created that took into account important factors for the functioning of WUAs as mentioned by Agrawal, Ostrom, Meinzen-Dick and Bruns.

The questionnaire was designed to acquire data in a consistent form by considering the farm size, the location to the canal as well as the specification of farm

activity. This allowed to display the data in a way that was suitable for scientists from other fields by enabling data visualization. The answers were subsequently coded and summarized in a spreadsheet.

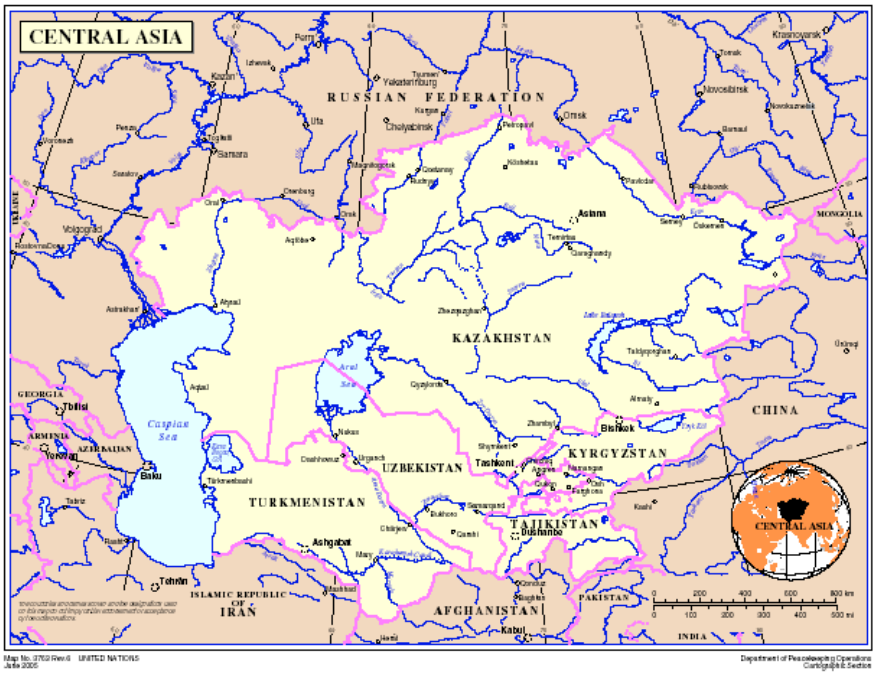
The thesis is built up as follows: after giving a detailed introductory background of regional characteristics and the historical development of water resources, Chapter 2 will present the management and WUA concepts. Chapter 3 will give the theoretical background of the research. In this chapter the basic instrument for arranging and discussing the findings will be established. The methodology will be described in Chapter 4. The type of methodology and its purpose will be elaborated in this chapter. Descriptive results will be presented in Chapter 5. The embeddedness of a WUA in the whole system and its specific characteristics will be discussed in this chapter. Chapter 6 focuses on the analysis. In this chapter the perceptions of water users on WUAs will be presented and analysed. The book ends with the chapter “Conclusions and recommendations”

2 BACKGROUND

This chapter gives an overview of the specific regional characteristics of the Republic of Uzbekistan and the Khorezm Region in particular. In addition, the historical background of the irrigation management from ancient times through the Soviet period until today will be described. Starting from section 2.4 the reader will notice that some phrases in the text are boldface. Their purpose is to systematically guide the reader through the factors influencing the success or failure of water management which will be discussed in the theoretical chapter 3. The chapter ends with information about the WUA concepts that are applied in the Republic nowadays.

2.1 Geophysical information about Uzbekistan

The Republic of Uzbekistan covers a territory of 447 000 km^2. It is situated in Central Asia between the rivers Amudarya and Syrdarya (Map 2.1-1) and shares borders with Kazakhstan, Kyrgyzstan, Tadjikistan, Afghanistan and Turkmenistan.



Map 2.1-1General Map of Central Asia (Oct, 1998, UN Cartographic Section)

Uzbekistan is characterized by an arid and sharply continental climate and a quick change from an unstable winter to a warm rainy spring, then to a dry summer and a warm autumn. Winters are very changeable: frequent light frosts are very often followed by intensive and long thaws. The average temperature in July is +30°C, in

January +3°C. It is much colder in the mountains and foothills. Typical for Uzbekistan is also a large number of sunny hours reaching 2 500-3 000 hours per year. On average 240-250 days a year are sunny days. The largest rivers of Uzbekistan are the Syrdarya (2140 kilometres) and Amudarya (1400 kilometres). There are many other smaller rivers, lakes and large man-made reservoirs. The republic is divided according to the types of landscape into mountains (9 % of the territory), foothills (12%), desert-steppe zone (5%), deserts (60%), and irrigated oases (14%) (Uzbek Embassy in, 2005).

The research area, Khorezm, an ancient and medieval state of central Asia, was situated in and around the basin of the lower Amudarya River. It is now a part of a region, namely North West of Uzbekistan. Khorezm is one of the oldest centres of civilization in Central Asia. (Encyclopedia, 2005). Khorezm belongs to the catchment area of the Aral Sea.

2.2 Natural characteristics of Khorezm Region

Khorezm differs from other regions of Uzbekistan by its hydro-geological, soil and climatic conditions. The topsoil of this region was formed on alluvial sediments of the Amudarya River. The climatic conditions in Khorezm can be described for the period 1990-2001 with data from the representative meteorological station “Urgench” (Glavgidromet, 2003) (Figure 2.2-1).

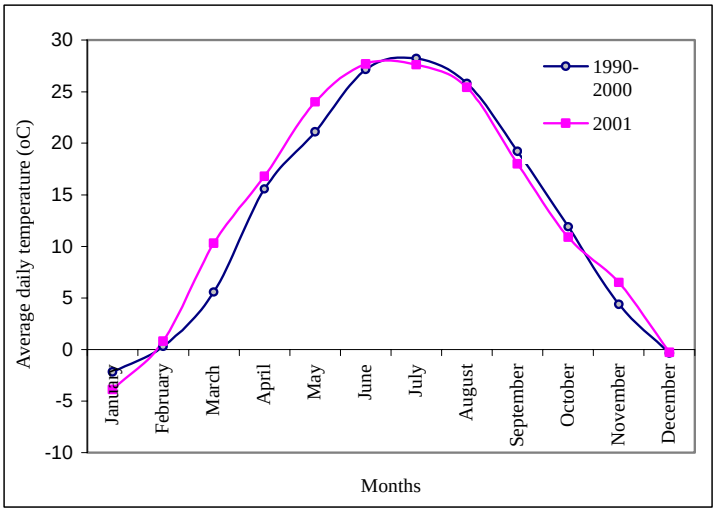


Figure 2.2-1 Air temperature (Urgench meteorological station) (Glavgidromet, 2003)

In this period, the coldest month was January with an average temperature of -2°C and a minimum temperature of -23°C. The hottest month is July with an average temperature of 28.2°C and a maximum of 43°C (Forkutsa, 2005).

Winter usually starts at the end of November and ends in the middle of February. Periodical night frosts may be observed until mid-April (Atashev et al, 1966, p.9). In terms of air humidity the region is very dry. In 2001, the average relative humidity reached a minimum of 35% in June. The most humid month in 2001 was January with a relative humidity of 81%.

The distribution of precipitation is irregular (Figure 2.2-2). Most rain falls between winter and spring. The average annual rainfall does not exceed 80-90 mm (Forkutsa, 2005). In some years only 40 mm of rainfall are recorded. Considering the annual evaporation rate of 1 600-2 000 mm, this means that the crop production in Khorezm is dependent on irrigation (Atashev et al, 1966, p. 10).

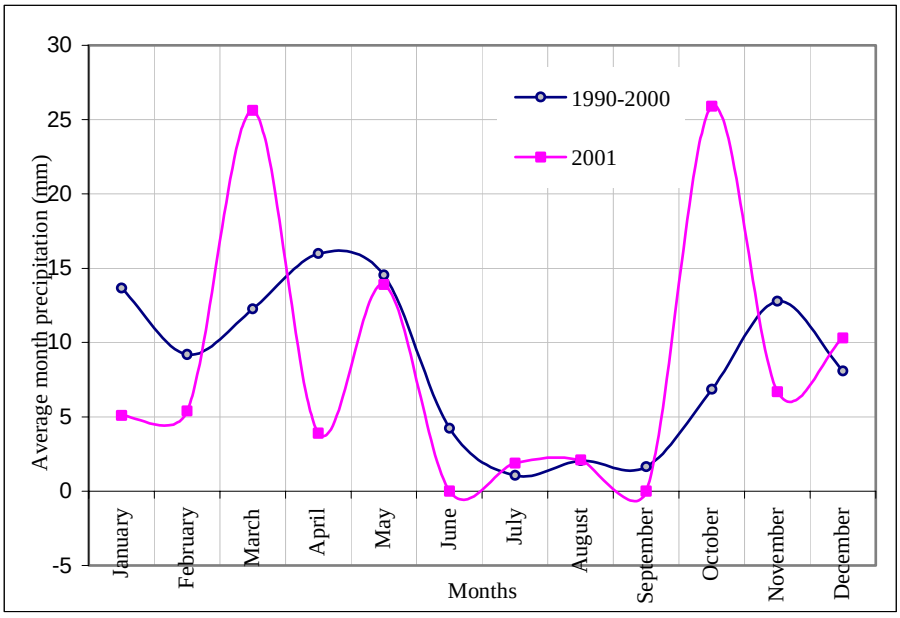


Figure 2.2-2 Precipitation ("Urgench" meteorological station) (Forkutsa, 2005)

The growing period is the least humid with a total rainfall of 21.8 mm, with a maximum in May of 13.9 mm and a minimum in July of 1.9 mm. In July (period of the most intensive evaporation) evaporation surpasses the amount of precipitates by 50 – 60 times. All this points to a significant importance of the contribution of groundwater and irrigation water for crop production (Atashev et al, 1966, p. 10).

The Aral Sea regulated the circulation of atmospheric air masses. Because of the large reduction in its surface area, this effect has been reduced (Popov et al, 1992, p. 13). Intensive wind erosion has occurred from the desiccated Aral zone to the adjacent irrigation areas, causing heavy economic losses in agriculture.

The leaching of soil salts generally occurs from mid-February till the end of March before planting.

2.3 Agriculture of Khorezm

In 1926, the Khorezm Oasis included irrigated land of the Khorezm Region in Uzbekistan, the regions Turtkul, Beruniy, Amudarya, and Ellikali in the Autonomous Republic of Karakalpakstan, and the Tashaus Region in Turkmenistan. The Oasis was a large cultivation region for cotton, wheat, rice and other crops.

The earliest data about the crop pattern of the Khorezm region is available from 1926. In this year, in the Khorezm region, 26 308 ha (18%) out of 148 480 ha of arable land were under cotton, 21 834 ha (15%) were under alfalfa and the rest (33%) was mainly occupied with grain crops (Atashev et al, 1966). Water use in the irrigation farming of Khorezm in 1926 remained sustainable. Crop types, their seeding and the timing of irrigation were determined by considering the water regime and peculiarities of the Amudarya River.

The production of cotton expanded from 18% of irrigated area in 1926 to 65.8% in the early 1930s. Later, by the early 1960s, the production of cotton remained stable and occupied about 54% of arable land (Khamidov, 1993, p. 4). In 1993, the annual production on irrigated land was 850-900 thousand tons of raw cotton and 150 thousand tons of rice with a total of 14.5 million m^3 of water per year being used for irrigation.

2.4 Irrigation of Khorezm Region

According to Tolstov (2005), “the ancient written sources about Khorezm remain very poor to this very day” (Tolstov, 2005, p. 21).

Ancient Khorezm remains a historical mystery. One of the reasons that I discovered during the field research was that Khorezm never belonged to Russian Turkestan or to the later established Turkestan Soviet Socialist Republic[8], and therefore little has been written about the historical background of Khorezmian irrigation.

[8]Khiva Khanate was a quasi-independent vassal under mutual obligation towards a lord, for military support or mutual protection, in exchange for certain guarantees. Later Khiva Khanate became a Protectorate (state territory controlled by a more powerful authority). After the October Revolution in February 1920, Khanate Khiva became the Khorezm People’s Soviet Republic, which was officially

The Khorezm Oasis is one of the most ancient regions of irrigation in the world (Hillel, 1992; Tolstov, 2005). According to historians and archaeologists, such as V. Bartold, A. Yakubosvky, S. Tolstov, Ya. Gulyamov, and B. Andrianov, the construction of canals in Khorezm started in the middle of the second century B.C. Originally, farming was based on the natural flood of the Amudarya. Later it was based on natural delta channels, from which water was directed into irrigation canals.

2.4.1 Organisation of irrigation system management and water use in the period from the 17th to the middle of the 20th century

The Khorezmian management of irrigation systems in the 17th century was based on the so-called "Khorezmian model" which originated from mahalla9 rules and conditions (Kadirov, 1998, p. 43) that were in place long before the Soviets introduced their irrigation system. The "Khorezmian model" of irrigation therefore differs from the approach used in other parts of Uzbekistan in that the administration is more based on customary local rules. Some names of the current Khorezmian canals and locations still refer to the "model".

The head part of large canals was called "*Sokka"*, the main canal was named "*Arna*", the distributive canal was called "*Yap, yab*", a network or branch of a canal was called "*bedaklar*", and the canals that provide water to the fields were named "*solmalar*". The first three terms *Sokka*, *Arna* and *Yab* are still in use, and are found in today's names of canals such as Tashsokka, Daryalik-Arna and Shikhyab.

The organization and maintenance of this highly sophisticated irrigation system required skilled as well as disciplined professionals and users. The local officials became responsible for the organization and supervision of irrigation works. In the Khan period, these officials were elected by the community. For example, in the epoch of Feruz Khan (late 14th – early 20th century) the secretary of the Khan's court, the poet Ogakhi, was responsible for the irrigation management. Ogakhi was named the "main *Mirob*[10] of the State".

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declared in April 26, 1920. In October 20, 1923 it was transformed into Khorezm Socialist Soviet Republic, which only survived for a year. In 1924, it was finally incorporated into the USSR and divided between the Uzbek SSR, the Turkmen SSR and the Karakalpak Autonomous Republic.

[9] Mahalla is a local term for 'community' in Uzbek and Farsi.

[10] Mirob is "water master" in Uzbek, Farsi.