Boundary management and the discursive sphere – Negotiating ‘realities’ in Khorezm, Uzbekistan

Anna-Katharina Hornidge *, Lisa Oberkircher, Anisiya Kudryavtseva

Center for Development Research, Zentrum für Entwicklungsforschung (ZEF), University of Bonn, Walter-Flex-Str. 3, 53113 Bonn, Germany

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A B S T R A C T

With independence in 1991, Uzbekistan, as most of Central Asia, entered into a phase of socio-economic transformation. In agriculture, this state-driven restructuring of the former system has concentrated on the ‘formal’ sphere of land and water governance.

This paper assesses water management in Khorezm, Uzbekistan, taking a social constructivist and boundary work-inspired perspective. Several limitations to effective water management in Khorezm exist. We argue that three types of practices are widely employed to manage these and assure water access: formal, strategic, and discursive practices. The discrepancy between the formal water management institutions, manifested and regulated through formal practices and the informal, widely pursued through strategic practices and acts of deviation, is overcome through discursive practices. Verbal references to formal institutions therefore hamper the formalization of informal practices. The institutionalized employment of all three types of practices fosters the production and reproduction of boundaries demarcating two, largely separate, spheres of reality in Khorezm’s water management. Consequently, a high degree of resistance to the integration of informal water management realities into the formal regulatory environment prevails, preventing mutual learning and thus the locally informed restructuring towards more efficient and sustainable water management in Khorezm.

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1. Introduction

Since the early 1990s, the countries of Central Asia have been undergoing diverse processes of socio-economic transformation, re-defining their economic, political and social systems. Uzbekistan, one of the most populous countries in the region largely depending on agricultural production, since independence in 1991 has actively restructured its agricultural sector. With regard to agricultural land, state farms (sovkhozes) were turned into collective farms (kolkhozes), and then into joint-stock companies (shirkats, literally ‘associations’). These were further dismantled and divided into farms (private farms) in the early 2000s (Veldwisch, 2008). In the field of irrigation water, the formerly separate ministries, the Ministry of Agriculture and the Ministry of Melioration and Water Management of Uzbekistan were merged into a single, centralized organization at the end of 1996; the Ministry of Agriculture and Water Resources (MAWRs) (Yalcin and Mollinga, 2007; Wegerich, 2005). Furthermore, from 2000 onwards, local-level water management became the responsibility of the newly state-established Water User Associations (WUAs; Veldwisch, 2008, 2010; Abdullayev et al., 2008).

Framed by these agricultural restructuring processes, this paper assesses the management of boundaries between ‘the formal’ and ‘informal’ spheres in the existing system of water management in Khorezm province, located in the irrigated lowlands of the Amu Darya River. In this region, the majority of the population works in agriculture, either as private farmers (fermers), peasants (dehqans), workers on private farms, or a combination of the latter two (Veldwisch and Spoor, 2008). Furthermore, due to the state plan on agriculture, three forms of production prevail: state-ordered

2 In 2009, these Water User Associations were renamed Water Consumer Associations (Law of Republic of Uzbekistan, Article 18-2).

3 In this paper we employ the distinction ‘formal’ and ‘informal’ as the prevalent emic differentiation of the two spheres in Khorezm, Uzbekistan. We consequently take into account the ongoing debate on the shortcomings of the institutional typology, originally introduced by North (1998) (Greif, 2006; Brunnson, 2002; Mielke et al., 2011; Hodgson, 2006), as well as its further developments (Helimke and Levitsky, 2004). We therefore adopt the distinction and terminology less with reference to North than to the framings employed by our interviewees when outlining and discussing the existing spheres of water management in Khorezm, Uzbekistan. We decided to use the notion of ‘spheres’ instead of ‘layers’ (a term used in systems theory-inspired thought on different layers of functional differentiation), as both spheres stand adjacent to one another, equally influential in the shaping of water management reality. Therefore, the vertical hierarchy implicitly suggested in the term ‘layer’ does not hold.

* Corresponding author.
E-mail addresses: hornidge@uni-bonn.de (A.-K. Hornidge), lisa.oberkircher@uni-bonn.de (L. Oberkircher), anisiyak@uni-bonn.de (A. Kudryavtseva).

1 For regional and district level presence, 13 regional (viloyat) and 163 district (tuman) departments were created.
production of cotton and wheat; state-order freed commercial production of rice (fewer vegetables, sunflowers, and fodder); and dehqan (peasant) production for home consumption and petty trade (Veldwisch, 2008). Therefore, water for agricultural production is of immediate, everyday importance to the existing system of livelihood provision. However, the ongoing institutional restructuring of the former system of water management is highly state-driven and concentrates on the ‘formal’ sphere, locally regarded as the sphere of ‘upper people’ and therefore the state. As such, we were repeatedly told by our informants “upper people are responsible for this [water delivery]” (field notes, 22/05/2009; 15/09/2009). Moreover, an elaborate and intensively applied ‘informal’ system of water management, which had been partially further nurtured by the shortcomings of the formal institutional systems in place, can be assessed. While this is not surprising, the wide discrepancy between the ‘formal’ and ‘informal’ systems demands further analysis of the building blocks of these parallel realities and the boundaries between them. Why are the ‘formal’ and the ‘informal’ spheres both so prevalent in the everyday life of post-soviet Uzbekistan, standing parallel in the organization of water management, as well as in the interpretation and attachment of meaning to this management? And why are these spheres apparently not mutually weakening, but instead mutually strengthening?

This paper conceptually draws on constructivist thought, especially the more recent discussions on communicative and discursive constructions of reality (Keller, 2011a; Keller et al., 2012; Knoblauch, 1995), as well as on the notion of ‘boundary work’, particularly the boundary crossing framework developed by Mollinga (2008, 2010). We argue that the socially, rather than physically, dividing boundary between the ‘formal’ sphere, manifested and regulated through formal practices, and the ‘informal’ sphere, widely pursued through strategic practices and acts of deviation, is crossed through discursive practices. As such, verbal reference to formal institutions of water management is understood as a way to actively reproduce formal water management discourse instead of formalizing informal practices. We understood ‘practices’ as conventionalized patterns of action, based on collective stocks of knowledge of the ‘proper’ way of acting, after Keller, 2011b, p. 55; Keller, 2011a, pp. 255–257). Keller distinguishes discursive practices and non-discursive practices as constituting the social processing of discourses, as well as model practices (i.e. templates for action) in discourses for the respective addressees. In the following we identify formal, strategic, and discursive practices of water management that are employed to ensure water access while simultaneously managing the relationship between the water users and the state. These practices, as shown below, are boundary-producing, as they demarcate and separate the ‘formal’ and the ‘informal’ spheres of water management in Khorezm. We understand ‘boundaries’ to be outcomes of human action that divide not merely on a physical basis, but rather on varying spatial and social scales. This is in line with ongoing discussions in political geography (Newmann, 2008; Paasi, 2005), as well as earlier in the sociology of knowledge (Gieryn, 1983; Amsler, 2007). Interested in the crossing and overcoming of these boundaries for improved water management, we draw on Mollinga’s boundary-crossing framework (2008, 2010), particularly the notion of ‘boundary settings’. He here stresses the role of organizational work in enabling boundary crossing. With regard to water management in Khorezm, this entails a discussion of the further development of the existing institutional system, accounting for ‘informal’ water needs and management practices to the same degree as ‘formal’ water management and its primary determinants.

This paper empirically draws on 3 years of qualitative and quantitative research into the socio-technical and symbolic aspects of water management. The research was conducted within the context of a 10-year, interdisciplinary project on the use of land and water in Khorezm/Uzbekistan. Specifically, this paper is based on extensive qualitative, semi-structured interviews and field observations during the period 2008–2011, primarily in the WUA of Ashirmat at the very end of the irrigation system. This material was further framed by a series of additional interviews in neighboring villages, and at the regional center Urgench, as well as by quantitative data collected through a survey of farmers. However, to allow participants to remain anonymous, we have mentioned no names and have used few direct quotes.

In 2008, we interviewed 50 leaders of cotton and wheat farms from Ashirmat WUA, only 11 of whom persisted as farmers under state plan after the land consolidation late in that same year. In 2009, all 21 remaining cotton and wheat farmers of Ashirmat and of two other WUAs were surveyed. Further interviews were conducted in 2010 to provide further insight: 20 took place with farmers, water managers and local officials in Ashirmat; 30 were carried out with officials and experts in Urgench; and 20 were undertaken with farmers, officials and local experts in other WUAs on the present practices of water and land governance.

This paper comprises five parts in total. The introduction is followed by a conceptual discussion of water management as boundary management by linking ongoing discussions in political geography to Mollinga’s boundary crossing framework, and identifying boundaries between the formal and informal spheres of water management in Khorezm. Section 3 discusses these boundaries and the different spheres of reality they demarcate. Boundary crossing then forms the focus of Section 4. Three types of practices, namely formal, strategic and discursive, are identified as commonly employed for the crossing, as well as the maintaining, of the identified (restrictive, but structuring) boundaries, with the aim of ensuring water access. A discussion in Section 5 concludes the paper.

2. Water management as boundary management: the social construction of resource use

The study of boundaries and boundary management is central to political geography. Although boundaries as the lines that enclose physical territories have formed the main focus of analysis in the past, recent interest has increasingly shifted towards boundaries as lines that separate, enclose and exclude, via varying spatial and social scales (Newmann, 2008; Paasi, 2005). Boundaries are no longer regarded merely as physically dividing lines, but instead as “specific forms of practice, symbols and institutions” that display economic, cultural and political power relations (Paasi, 2011: 18). In the sociology of knowledge, these “boundary producing practices” have been studied and conceptualized under the notion of ‘boundary work’. Thus an analytical concept studying the ways in
which ‘fields of legitimate knowledge’, ‘truths’ or ‘realities’ are constructed, maintained, transformed, and broken down through discourse (Gieryn, 1983; Camic and Xie, 1994; Fuchs, 1986; Amsler, 2007). The boundaries of these ‘fields of legitimate knowledge’ or ‘knowledge units’ are consequently neither pre-given nor fixed, but instead are fluid and constantly negotiated “in contests for professional legitimacy, cultural authority and material or social resources” (Amsler, 2007, p. 3 with reference to Gieryn, 1983). In Khorezm, the material resource that is managed is water, and its management is contested, less through voiced criticism and verbal negotiations, but more through practices that deviate from the formal rules of water management. We assess these practices in their boundary-producing role.

The idea of boundaries and the need for boundary work in natural resources management has largely been developed within US-American sustainability science for the research-policy interface. It is argued that the mobilization of credible, salient and legitimate knowledge (Cash et al., 2003) in processes facilitated through conscious boundary work, and paying attention to communication, translation and mediation of this knowledge, can enhance the influence of research on policy-making. Mollinga (2008, 2010), further developed this idea into what he calls the boundary-crossing framework, with specific reference to water management as well as inter- and transdisciplinarity natural resource-related research. He identifies ‘boundary concepts’, ‘boundary objects’ and ‘boundary settings’ (Table 1) as pillars of effective boundary-crossing and argues that the careful co-ordination of all three helps to ‘rationalize dissent’ (2008, p. 22).

Referring to Pohl and Hirsch Hadorn (2007), as well as ongoing debates on transdisciplinarity, Mollinga points to systems, target, and transformation knowledge as influencing one another to determine the success of interaction and cooperation at different interfaces and across different boundaries. He then goes on to argue that three types of boundary work are required for improved natural resources management, while simultaneously posing a substantial challenge (Mollinga, 2010, p. 8): (a) “analytical work for understanding: the development of boundary concepts; (b) instrumental work for action: the design and construction of boundary objects; and (c) organizational work to facilitate the former two: the shaping of boundary settings.”

In this paper, we support the voiced need to identify boundaries and the different ways, or ‘types of boundary work,’ to overcome them for improved natural resources management. However, with regard to the three pillars (‘boundary concepts’, ‘boundary objects’ and ‘boundary settings’), the focus of this paper lies on the ‘setting’, meaning the infrastructural, institutional

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**Table 1**  
Boundary-crossing framework. Source: Authors’ compilation.

| Boundary concepts | Knowledge for understanding | “...” boundary concepts are words that operate as concepts in different disciplines or perspectives, refer to the same object, phenomenon, process or quality of these, but carry (…) different meanings in those different disciplines or perspectives. In other words, they are different abstractions of the same “thing.” (Mollinga, 2008, p. 24) |
| Boundary objects | Knowledge for doing | “[…] devices and methods that allow acting in situations of incomplete knowledge, nonlinearity, and divergent interests.” (Mollinga, 2010, p. 4) |
| Boundary settings | Getting the institutional arrangements right | “[…] in which these concepts, devices, and methods can be fruitfully developed and effectively put to work.” (Mollinga, 2010, p. 4) |

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**Fig. 1.** Location of Khorezm Province.

*Source: ZEF/UNESCO-Project GIS Lab.*
and socio-cultural realities, of water management. We identify several limitations in Khorezm’s water management system, which foster the increasing employment of three types of boundary-producing practices. The drawn boundaries demarcate different spheres of reality in Khorezm’s water management. Specifically, we examine the ‘formal’ and ‘informal’ spheres of water management, as well as at the practices locally employed within, as well as between, each of the two spheres. Therefore, we assessed the practices that enable these boundaries to be continuously reproduced.

3. Agricultural water management and its defining boundaries

Khorezm province is situated in the irrigated lowlands of the Amu Darya at a distance of approximately 350 km from the current shore of the Aral Sea. It encompasses an area of 5060 km² and was inhabited by 1,517,500 people as of 2008 (UzStat, 2009). Approximately 3.5–5 km³ of water is annually diverted from the Amu Darya to irrigated fields in Khorezm through a dense 16,000 km network of irrigation channels. The water arriving in Khorezm collects in the Tuyamuyun water reservoir, and its volume is rationed, depending on the monthly water demand in the region. Over 95% of water is used for agricultural purposes. Irrigation water is conveyed to the fields in open, non-lined canals resulting in substantive losses, due to evaporation and groundwater discharge (Hornidge et al., 2011b). Furthermore, due to its lowermost location, Khorezm’s water situation depends heavily on the areas upstream (Fig. 1).

Agriculture, and in turn water management, is characterized by the high level of involvement of the Uzbekistan central government in agricultural decisions at farm, district, regional and national levels. Area- and production-based state quotas are in place for cotton and wheat, with compulsory sale to the state at fixed prices, preferential credits for input supply and agricultural norms, and regulate cropping patterns and agricultural practices. As water supply is a key factor for the fulfillment of production quotas, the cotton and wheat quotas are major determinants of the irrigation water management process. In July 2003, the then water management administrative system was re-organized into an irrigation basin water management system, based on hydrological borders, with the aim of improving this process and in line with the division of agricultural land into small, private farms (Veldwisch, 2008). This also entailed the establishment of 10 irrigation basin management authorities and one main canal management authority. However, the actual physical delivery of water has continued to be severely hampered by an inadequate human, financial, and technical infrastructure (Veldwisch, 2010; Veldwisch and Spoor, 2008; Wegerich, 2010). This has resulted in poor functioning of the irrigation and drainage infrastructure on the main and sub-canal, as well as at the farm level (Manschadi et al., 2010; Tischbein et al., 2011).

These limitations of effective water management are further exacerbated by a high degree of uncertainty regarding land use rights. Land is state property that is leased to farmers in contracts extending up to 50 years (Trevisani, 2008). Despite these contracts, leases remain subject to the state, as illustrated by the division and re-consolidation of farm land from the 2000s onwards. In the early years, the subdivided and ‘privatized’ production units generally ranged between 10 and 25 ha in size (Veldwisch, 2008; Trevisani, 2008; Lerman, 2008). However, in November/December 2008 and January/February 2009, farm land was re-consolidated. This was followed by a second wave of re-consolidation in January/February 2011, creating cotton–wheat farms of 75–150 ha in size. (Djanibekov et al., 2010; Eichholz et al., 2012). The combination of a reliable state plan and unreliable land lease contracts increases the dependence of farmers on the fulfillment of the state plan, weakens their potential to independently plan, invest or innovate, and lowers their interest in taking the path of longer-term planning. For water management at the farm and field level, this means that water-saving techniques that come with investments are little practiced (Oberkircher, 2011; Oberkircher and Hornidge, 2011). This top-down governance approach predefines the limited space for upwards public participation, accountability and transparency (Hornidge et al., 2011b; Schlüter et al., 2010; Schlüter and Herrfahrdt-Pähle, 2011). However, despite the state plan with its impediments to innovation (Hornidge et al., 2011a), farmers in Khorezm have proven to be active experimenters, developing local knowledge to improve their cotton and wheat yields. Wall (2008, p. 122) states that “within these conditions there is a surprising level of innovation and experimentation”. This knowledge creation and implementation takes place within the space of maneuvering granted by the politically restrictive system. However, innovations that oppose agricultural state norms (i.e., large scale crop rotation) do not occur (Wall, 2008, pp. 122–123).

The authoritarian system of state control over knowledge acquisition that can be identified in the high-level research commissioned by the government (Selim, 2009, pp. 80ff; Wall, 2008, pp. 141ff), has also led to high levels of self-censorship in the realm of local, agricultural knowledge production (Hornidge et al., 2011a). Wall (2008, pp. 85ff) identifies five characteristics of the local knowledge system of Khorezm. First, local ‘masters’ (‘wise men’) with specialized knowledge, embedded in the patriarchal and hierarchical culture of the region, are central to the system and often hold positions of political and economic power. Second, in terms of knowledge dissemination, family-based modes of knowledge reproduction and transfer are common. Access to external knowledge and its reproduction in the local knowledge system exists, but to a lesser extent. Third, in sectors of immediate importance to the state agricultural production system indigenous, local knowledge lies at the interface with formal, university taught knowledge. Wall here assesses a linear, top-down approach to knowledge diffusion with little mutual exchange of ideas (2008, pp. 110ff). This links with Wall’s fourth point: ‘collective knowledge’, which is rather unitary in nature, and prevails in the Khorezmian agricultural knowledge system, leaving little space for creativity-fostering

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Source: Authors’ elaboration.

Fig. 2. Water allocation through limits.
diversity. Fifth, this unitary nature of knowledge is further exacerbated by ongoing ‘knowledge loss’ in post-Soviet Khorezm (Wall, 2008, pp. 123ff). Turaeva-Hoehne (2007) adds to this the emic distinction between katta (big) and kichkina (small) Uzbeks fostering a complex and hierarchically organized system of coercive reciprocity, limiting the individual’s flexibility and risk-proximity.9

To sum up, effective water management in Khorezm is hampered by several limitations that encourage actors to employ practices that further strengthen boundaries demarcating the spheres of water management reality in Khorezm, Uzbekistan. We here identify five limitations as most pertinent: (a) infrastructural and (b) institutional deficits, resulting in the mismatch of water allocation and water delivery; (c) authoritarian state control, manifest in the agricultural quota system and limiting individuals’ innovativeness by side-lining bottom-up idea development into the sphere of informality/illegal; (d) a vertically structured knowledge system, creating limits to creativity and agency development; and (e) a hierarchically organized society with a complex system of coercive reciprocity, paving the way for discursive practices and limits to formalizing the informal. Dealing with these limitations results in the strengthening of the boundaries that define the realities within which water management is taking place. The locally evolved system of water management is characterized by the managing of these boundaries, in turn.

4. Negotiating ‘realities’

These boundaries have been strengthened by constantly dealing with limitations, i.e., infrastructural and institutional deficits, an incapacitating state presence, with its impediments to free thinking, knowledge development and diffusion and a high degree of system stability, due to a complex system of coercive reciprocity. Therefore, boundary crossing has resulted in three widely employed types of practices: formal, strategic, and discursive. While formal practices follow formal rules of water management for ensuring water access, strategic practices follow informal rules and possibilities and form acts of deviation from the ‘formal’. However, these acts are covered up through discursive practices, in which the formal is strengthened, while simultaneously deviated from in practice.

We therefore regard the above identified limitations as boundary-producing, in the sense that dealing with these limitations invites practices that reinforce the coexistence of two different spheres of water management reality, rather than fostering the development of one management system that serves ‘formal’ and ‘informal’ needs on an equal basis.

4.1. Formal practices

After water has been diverted from the Amu Darya into Khorezm’s irrigation system, several state organizations (Fig. 2), on different administrative levels, are formally responsible for the allocation and delivery of water from the off-takes along the river to the entrance of the WUAs. Allocation refers to the assignment of water-limits10 to different units within the irrigation network. It is formally regulated in decree #385 (03/08/1993), the appendix to the MAWR-order #165 (13/09/2003) and a manual developed for Khorezm in 1987.

These water-limits are determined through water requests or so-called Water Use Plans (WUPs). WUPs are generally based on the irrigated area, planted crops and the respective irrigation state norms, which are specific for every crop located at a certain hydromodulus zone. The irrigation norms and timing used in the WUPs were originally defined in 1960 (Khirst and Ikramov, 1995), on the basis of the crops, climate, soil characteristics, and groundwater levels of each zone. In addition to water-limits for crop irrigation, those for leaching the fields are allocated on the basis of soil salinity appraisals (Tischbein et al., 2012). The WUPs are passed on and aggregated at various organizational levels from the dehqon and farmer via the WUA, the sub-basin irrigation system authority (UIS) and the lower Amu Darya basin irrigation system authority (BUIS) to MAWR at province level. The allocation of water-limits is done vice versa, from the national MAWR downwards, and water quantities are allocated among different water management units at each level (Veldwisch, 2008; Martius et al., 2009). Therefore, the national MAWR is the ultimate authority responsible for the planning and allocation of irrigation water in Uzbekistan.

The actual physical delivery of water, i.e., the operation of technical structures, is primarily the responsibility of the Main Canal Management (MCM) units of the UIS, the WUAs, and the water users themselves (Veldwisch, 2008). It is the responsibility of the UIS to deliver the water to the water intake points of the WUA and, in turn, it is the responsibility of the WUA to deliver it to the water users. However, as mentioned above, due to inadequate human, financial, and technical resources, the WUAs are largely unable to provide the required services (Veldwisch, 2010; Veldwisch and Spoor, 2008; Wegerich, 2010). Similarly, the on-farm irrigation and drainage network, formally the responsibility of WUAs, formed between 2000 and 2005, has been deteriorating (Abdullaev and Mollinga, 2010; Hornidge et al., 2011a; Veldwisch, 2008). Consequently, while formally water delivery should match the water allocations, the water quantities actually delivered depend on many factors, with only one of these being the official limits.

4.2. Strategic practices

Veldwisch (2008) has shown that in years during which there is an average abundance of water, water management reacts rather effectively to the demands of water users, and shows considerable flexibility. He explains this on the basis of the different strategies that water users apply to obtain access to water outside the formal functioning of the water management organizations. Such strategic practices are a deviation from the formal rules of water management, and reveal the strong agency of the actors who follow their own set of informal institutions.

One example is the use of small, unregistered mobile pumps to lift water into field canals. If the water withdrawal is not permitted and documented by the WUA, this is formally considered an illegal theft of water, but informally it is a widespread practice (Oberkircher, 2011). At pumps, shared between farmers and dehqons, pump management is a negotiation process in which social relationships play a significant role. However, it becomes strategically even more important to use such relationships when actors aim to influence decisions on water delivery. In a survey of WUA Ashirmat in 2009, 17 of 21 farmers stated that they would go to the WUA chairman and make a request when in need of water, i.e., they would follow formal practice. However, 14 farmers also mentioned that they would approach the village mayor or neighborhood leader for water, while 10 would even go to the hokimiyat, all of whom are influential agents, but are not formally responsible for water management. In our interviews, this importance of social relationships in assuring water access was locally and commonly summa-

9 The notion of ‘coercive reciprocity’ depicts a system of mutuality that takes on the character of a socio-culturally enforced norm; therefore a reciprocal give and take relationship in which giving and helping each other out is a compulsory/socially enforced, rather than voluntary, act amongst actors.

10 Uphoff (1986: 38) speaks of the “assignment of rights to use water”.

11 Our data show that actual water delivery regularly exceeds the water-limits by up to 10%.
rized by the statement: “[I/He/They] can get water” (field notes, 04/08/2008; 11/09/2008; 20/07/2009).

Oberkircher (2011) and Eichholz et al. (2012) argue that the pursuit of individual (water) interests as a social activity derives its legitimacy from the role of an individual within a network of patron–client relationships. In this respect, village mayors, neighborhood leaders and persons close to the hokim are as much a part of the network as the formally responsible water managers. The position of patrons is accepted and strengthened by the clients, and sanctioning can be expected only from superior or competing patrons. Therefore, by catering to the water demands of individuals, water delivery according to strategic practice (with the help of technical means or social relationships) is a deviation from formal water management institutions, but simultaneously effectively compensates for the inadequacies of the formal water management organizations – at least for influential agents.

Furthermore, strategic practices are employed on a higher water management level: the WUA is formally responsible for water delivery to the farmers; however, this delivery is often controlled and monitored by the staff members of the state organization, the UIS. Due to this strategic practice, the UIS staff makes it possible to deliver water to, and monitor the irrigation of, areas that the WUA is unable to supply with water, while simultaneously strengthening their individual influence in the patron–client network of water management. Examples of such areas are lands irrigated by gravity or by pumps, but for which the WUA could not provide the manpower, as well as lands freed from the state plan, due to high salinity levels, but then used for rice cultivation.

The sanctioning or ignoring of violations of formal rules appears to be widely based on strategic considerations, particularly those concerning social relationships. For example, irrigation water must be supplied formally only if a cotton field is prepared according to prescribed agro-technical measures. However, the violation of this formal rule was repeatedly witnessed with no intervention from canal managers, who were aware of the violation. Therefore, Hornidge et al. (2011b) argue for the strengthening of water inspectors at district level (under the state organization Uzsuavnazorat), as well as the introduction of local water inspectors (which was carried out in WUA Ashirmat in 2009).

One of the external factors increasing the prevalence of strategic practices for access to irrigation water is water scarcity. When water was scarce during the drought year of 2008, farmers installed pumps wherever they could find water, including drains. Only some of these pumps were registered, and the formal rules for what was considered legal and illegal were of little relevance to everyday practices under extreme water scarcity. The individual agency of farmers who made use of technical, organizational and socio-political water control (Oberkircher, 2011; Eichholz et al., 2012) prevailed over formal practices. This dominance of individual, rather than collective, action approaches also explains the increasing number of water conflicts during years in which water was scarce (Wegerich, 2008).

4.3. Discursive practices

Therefore, water management in Khorezm is shaped by two parallel systems of practices: (1) the official system with practices reflecting formal institutions formulated on paper and (2) the strategic practices that individual agents apply to pursue their interests and which follow informal institutions. The strategic practices are widespread in the case study locations at different levels of the water management system, so it is surprising that they are not more clearly sedimented in the formal body of water management. It should be expected that such practices would, in the long-run, result in a challenge to the formal water management structure, leading to (formal) institutional change. Despite change taking place on the basis of deviation from the formal, it is not as prominent as one may expect. On the contrary, change appears to be taking place slowly and sporadically, and in the midst of frequent malfunctioning of water management and widespread deviation, the formal structure appears to be surprisingly resistant.

We explain this high level of resistance toward change by pointing to the continuous processes of strengthening and reproducing the system through the discursive practices of the actors involved. In his theory on the communicative construction of reality, Knoblauch assesses reciprocal, communicative action as a crucial determinant for the continuous construction and reconstruction of multi-layered ‘subjective’ and ‘objective’ realities (Knoblauch, 1995, 2001). Keller encourages an even more explicit look at the practices constituting action, and stresses the powerful role of discursive practices in constituting discourses as structural elements of objectifying ‘reality’ (Keller, 2001, 2011a,b).

Deviation is commonplace in the water management of Khorezm. However, the actors involved simultaneously spend considerable effort and resources discussing compensation. When farmers diverge from the rule that cotton, as a state crop, should be irrigated before the cash crop, rice, observations in WUA Ashirmat have shown that they are very likely to state that cotton must be irrigated first in any official conversation. While individuals actively take water management into their own hands, their statements suggest the opposite: In a survey conducted in 2010, 47 of 56 farmers stated that ‘water management is more up to the state’ than ‘up to the farmer’ – an answer very much in line with the present day Soviet legacy in public discourse (Oberkircher and Hornidge, 2011). Likewise, the same 47 farmers stated that ‘everybody has the same possibilities to get water’ while our observations confirmed what was said by only the minority of nine farmers, namely that: ‘more influential people have better possibilities to get water’.

The year 2010 was considered by water managers to be one in which water was abundant, and we observed that farmers took water beyond the formal limits (strategic practice). However, in interviews they primarily claimed that water was delivered to them according to the water-limits (discursive practice). In one case, a farmer who explicitly asked to remain anonymous refrained from the discursive practice of verbally sticking to the formal rule and instead confirmed our field observation:

“During vegetation period it is not necessary to submit the water request. The water is always in the canal. […] The water supply is constant. We take water when we want. We took water even more than the norm” (field notes, 23/09/2010).

At the state water management organizations (UIS and BUIS) level, discursive practices are primarily employed with the purpose of covering up the mismatch between strategic and formal practices, especially for the sake of reports aimed at an inspection by other state actors. An example of such discursive practices is to maintain two parallel reporting systems: one formal and one informal. The formal reporting system coordinates data and information sharing from the UIS or BUIS to MAWR and vice versa, and reflects the facts and numbers that would be officially expected. The informal reporting system in turn coordinates information and data sharing from MCM to the UIS, or to the district hokimiyat, and from the UIS to the provincial hokimiyat and vice versa, i.e., it provides actual data and information for daily decision-making and water problem-solving.

In reality, this entails the commonly employed practice of farmers submitting written water requests for the formally assigned amounts, while simultaneously verbally requesting the genuine water amounts (which usually differ from that formally requested). As such, at the level of the irrigation water management organizations, which largely remains in place from Soviet times,
the formal reporting system is further supported by being formally served, while decreasingly capturing water management reality. Furthermore, it indicates how highly formal, strategic and discursive practices are mutually interwoven: while formal practice is followed, it is simultaneously circumvented by the strategic practice of also verbally requesting the genuinely required (not formally assigned) amounts. However, by equal employment of both practices, discursive practice makes up for the deviation from the formal rule and the formal regulatory body of water management is strengthened. However, the increasingly permeable boundary between the formal and the actual spheres of water management is closed even more and simultaneously covered up. Therefore, all three types of practices can be observed in one.

These discursive practices to some extent certainly reflect the political risk that any openly admitted deviation from formal practices carries in an authoritarian state. It is also understandable that many actors have multiple roles, being individual agents with a distinct role in a patron–client network on the one hand and state representatives on the other, with the latter creating a stake for them to preserve the status quo of the formal water management institutions. However, the very prominence of these discursive practices at all levels of the hierarchy, down to the peasant farmers, suggests that such practices have a meaning that goes beyond these motivations. We argue that the discursive compensation essentially reflects the extent to which the formal rules and roles of water management have been institutionalized in the sense of Berger and Luckmann (1984). These authors regard reality as a social construct, produced by humans through their social practices and reproduced in and through discourses. Institutions that we encounter in Khorezmian water management have been constructed in their historical context as rules of conduct and specifically defined roles for the actors involved. These institutions and their roles are ‘reified’ (Berger and Luckmann, 1984), unquestioned, accepted, and passed on in society as social facts.

Verbal reference to the formal institutions can be understood as a way to actively reproduce the formal water management discourse, instead of formalizing informal practices. Acts of deviation (strategic practices) acquire the character of exceptions, special acts in a particular situation, no matter how frequently they occur. They are accepted and applied, but do not challenge the formal water management discourse. However, what makes the reified institutions so inviolable, although deviation is little sanctioned and is even habitualized and sedimented in informal institutions? We argue that a collective aspiration of stability motivates this resistance. Change in Khorezm since independence has been perceived as largely negative, particularly within agriculture. The population in the case study WUAs portrays Soviet times as golden days of order and abundance, which has been followed by a process of decay and chaos since independence. One of our informants narrated: “Water was much better [in Soviet times]. We always had water, day and night. There were a lot of birds and fish” (field notes, 21/07/2008). Furthermore, Schlüter et al. (2010, p. 620) assess an increasing “bottom-up consolidation of the existing status quo via informal processes and networks” preventing social learning and change adaptation in Uzbekistan’s water management. Trevisani reflects on this local consideration of change as being highly undesirable, and describes Uzbekistan’s path after independence as a process of ‘thirdworldization’ (Trevisani, 2008).

Fig. 3 illustrates the interrelation of the three types of practices. Formal institutions, while influential, are frequently side-stepped and replaced by informal institutions. Although this deviation from formal rules may be necessary to reach individual goals or deal with the malfunctions of formal institutions, the resulting display of agency and strategic practices are of a rather applied and situational nature. They are used as coping strategies in struggles over power and water, but are not easily followed by change and innovation in the discourse. Therefore, formal water management shows a very strong continuity that is the result of an equilibrium of deviation and agency on the one hand and discursive practices, strengthening formal institutions, on the other.

5. Concluding discussion

While water management in Khorezm is challenged by several limitations, the widespread interwoven employment of formal, strategic and discursive practices facilitates coping mechanisms. However, it simultaneously results in the drawing of boundaries demarcating increasingly fragmented ‘formal’ and ‘informal’ spheres of water management. These different, and mutually undermining, spheres foster a high degree of static stability and resistance towards change in both, but especially in the formal, systems of water management.

We identified five limitations as most pertinent: (a) infrastructural and (b) institutional deficits, resulting in the mismatch of water allocation and delivery; (c) incapacitating state presence; (d) a vertically structured knowledge system, creating limits on creativity and agency development; and (e) a hierarchically organized society with a complex system of coercive reciprocity. We argued that these limitations and the practices employed to cope with them are shaping the setting in which water management is taking place, and as such are constantly producing and reproducing boundaries demarcating the two spheres of water management. While formal practices follow formal rules of the ‘formal’ sphere, strategic practices, and deviations from the formal, follow informal rules and so demarcate the ‘informal’ sphere. However, the co-existence of both spheres, and the boundary between them, is strengthened by discursive practices (along the lines of Keller) employed to verbally confirm the formal, while in reality following the informal. For example, the avoidance of openly voiced differences between the official water accounting and the actual water management (through discursive practices) prevents conflict, but also prevents change and further development of the official system of water planning along the (a)ctual water delivery. As such, the institutionalization of the evolving water management practices on the ground is prevented due to a lack of communication of these changes and evolutions in the formal sphere. Due to this prevented institutionalization, local water management practices remain informal and in the sphere of deviation from the formal. Therefore, the boundary between the ‘formal’ and ‘informal’ spheres becomes less permeable, covered up, and appropriated by the continuous employment of discursive practices.

Mollinga argues that improved management of natural resources requires three types of boundary work: the development

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of (analytical) boundary concepts; the design and construction of (organizational/institutional) boundary objects; and the shaping of (organizational/institutional) boundary settings. We focused on the practices that enforce the boundaries between two spheres of water management. The shortcomings of the institutional structures in place to incorporate widely used practices of informal water management into the formal sphere also became implicitly clear as part of this. Consequently, the lack of boundary settings and the parallelism of the ‘formal’ and the ‘informal’ spheres, strengthens the existing boundaries and the resulting lack of mutual learning, while preventing a joint further development of the formal and informal. Institutional spaces and processes allowing for the participation of local water managers and users, knowledgeable with regard to informal management practices, do not exist in a restructuring process of formal water management. Even WUAs (recently renamed Water Consumer Organisations), which at least in the minds of the donors were created to allow for this local level interaction, in reality have a poor decision-making mandate, experience regular interventions by local khokims, face severe challenges in fee collection, and consequently malfunction (Hornidge and Ul-Hassan, 2010; Djanibekov et al., 2012; Schlüter et al., 2010). Instead, discursive practices that cover up the existing boundaries and the divide strengthen further development of the parallel, and often mutually conflicting, two spheres. However, the widening divide between the two spheres requires the spending of increasing resources (i.e., time and labor) on discursive practices. For example, after performing the actual water management tasks additional time and energy is spent in filling in the lists of water deliveries, according to the formally assigned amounts (Veldwisch, 2008). As such, not merely the improved natural water deliveries, according to the formally assigned amounts, but also additional time and energy is spent in filling in the lists of the widening divide between the two spheres requires the spend-parallel, and often mutually conflicting, two spheres. However, boundaries and the divide strengthen further development of the establishment of boundary settings, allowing for the open communication of different realities in the ‘informal’ and ‘formal’ spheres. However, on assessing the key determinants of water management in these spheres, it becomes obvious that this open communication of different realities, and thus weakening of the boundaries demar- cating them, would require a loosening of the state plan on cotton and wheat production. In Khorezm’s current system of agricultural production, the ‘formal’ sphere is organized around fulfilling the production quota. As such, it stands in clear competition with rice cultivation, which is commercially far more interesting for the individual farmer and is consequently a key determinant of the ‘informal’ sphere. The loosening of the state plan on cotton and wheat as boundary-setting in itself, can therefore be regarded as a necessary precondition for further boundary settings, allowing for the formalizing of informal, but widely employed, water management institutions. The process of actually openly voicing the limitations of today’s water management, and the practices employed in order to cope with these, could then be the responsibility of legally strengthened Water User Associations. Associations which are less controlled by local khokims, and instead equally represent commercial (fermer) and peasant (dehqon) farmers. In the case of such (currently unrealistic) changes, increased mutual learning and the development of both spheres, according to the actual needs and practices of water management that currently guide informal management, but are largely overlooked in the formal sphere, could be achieved. Furthermore, on the level of simple resource allocation, the freed resources from a lesser employment of discursive practices could positively contribute to more efficient, and therefore more sustainable, management in a future situation of increasingly likely water scarcity.

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