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Constraints on Collective Action in a Transitional Economy: The Case of Bulgaria's Irrigation Sector

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Summary. — Irrigation, until recently a major water user in Bulgaria, has been drastically affected by the political and economic changes that came about after the collapse of the socialist system. Collective action might be a way for societies to overcome the well-known common-pool resource dilemma, thereby securing sustainable water management. This article questions whether measures to facilitate local self-governance could be successful in Bulgaria. Empirical results suggest that local actors use power asymmetries to maintain their opportunistic strategies, and the governance of information plays an especially important role. Moreover, distrust between community members plays a crucial role in constraining the evolution of social capital, which is a prerequisite for collective action.

Key words — Eastern Europe, Bulgaria, irrigation, collective action, institutional change, social capital

1. INTRODUCTION

In transitional economies, merely changing regimes and laws proves insufficient in increasing economic productivity and, at the same time, ensuring the sustainable management of natural resources. In contemporary Bulgarian and other transitional economies, the agricultural sector buffers the national economic decline. The recent development of small-scale subsistence farming has absorbed the unemployed and reduced rural poverty, both of which have increased due to the enormous difficulties associated with the transition from a centrally planned to a market-oriented economy. A closer look at the agricultural sector within Bulgaria reveals the uneven distribution of natural water resources over time and space, making irrigation necessary to reduce production risk. Irrigation, until recently a major water user in Bulgaria, has been drastically affected by political and economic changes, and by the reforms in agriculture that began in 1989. The Bulgarian irrigation systems were built to serve large production units during socialism and do not meet the needs of the huge number of small-scale landowners that emerged following the land restitution process. At present, the facilities have largely deteriorated. During Bulgaria's transition period, the amount of water used for irrigation sharply declined; only 5% of the fields equipped with irrigation devices are actually irrigated (Petkov, 2000, p. 49).

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Collective action management solutions have been propagated for more sustainable resource use from the government and the World Bank in recent years. The Bulgarian government enacted two new laws: the Bulgarian Water Law, implemented in January 2000, and the Water User Association Act, which came into force in March 2001. Both legal acts are driven by the state's motivation to encourage collective action and to establish water user associations (WUAs) in order to achieve sustainable water management. The aim is to reform and decentralize the former centrally planned water sector and to increase the involvement of local actors. Since 1991, many World Bank projects have attempted to set up WUAs (World Bank, 1999). Most of those associations, however, were only formally created. In practice, they are neither functioning nor familiar to the farmers in the respective villages. Regardless of these formal efforts, little collective action in the irrigation sector has been observed in Bulgarian villages.

As known from many common-pool resource studies, there is a range of possibility for collective action in the irrigation sector. In this article, I argue that measures to facilitate local self-governance cannot be successfully carried out in Bulgaria. Present formal attempts find no common ground where collective action can grow. Based on empirical work, I will show that features specific to transformation countries—such as the discrepancy between formal political intentions, informal effective institutional change at the local level, and the high dependency on information and knowledge asymmetries—lead to behavioral attributes that hamper collective action solutions.

First, I discuss the common-pool resource theories and transition economics that form the study's theoretical basis and analytical framework. Thereafter, I describe the study's methodology. In Section 4, I give empirical evidence for the incongruity of formal and informal rules in the transformation process. I focus on local power abuse as a behavioral attribute typical of the transformation process. Empirical results highlight governance of information and corruption as power strategies (Section 5). I analyze the deterioration of social capital in Section 6. Distrust, envy, perception of corruption, and negative attitudes toward collective action are empirically investigated as transformation-specific variables. Finally, I conclude with a brief summary of findings and implications for collective action programs.

2. COLLECTIVE ACTION FOR AN IRRIGATION SECTOR IN TRANSITION

This section will attempt to make a unique contribution to the discussion of common-pool resource management by complementing common-pool resource theories with aspects from transition economics.

(a) *Common-pool resource theory*

Common-pool resources can be managed by a variety of property regimes ranging from government to common property, from privately owned to open access. Bromley and Cernea (1989) and Bromley (1992) state that there is no such thing as a common property resource *per se*; there are either resources controlled and managed as common property, state property, or private property, or resources for which no property rights have been recognized. For Bromley (1992, p. 14).

> Irrigation systems represent the essence of a common property regime. There is a well-defined group whose membership is restricted, there is an asset to be managed (the physical distribution system), there is an annual stream of benefits (the water which constitutes a valuable agricultural input), and there is a need for group management of both the capital stock and the annual flow (necessary maintenance of the system and a process for allocating the water among members of the group of irrigators) to make sure that the system continues to yield benefits to the group.

The resource under review in this case can be characterized as a common-pool resource with the formal institutional arrangement of a common property regime, but the effective local rule seems to be open access—that is, no property regime. The well-known common-pool resource dilemma is often the consequence of that property regime. The expression "tragedy of the commons" denotes the degradation of the environment that occurs whenever a great number of individuals share a subtractable resource without an effective property rights regime. In his famous article Hardin (1968) explains the logic behind this model using the well-known example of a pasture accessible to everyone. He concludes that, since users pursuing their self-interest are likely to ignore the effects of their actions on the pool, the majority of the resources used bear the risk of a tragedy of the commons. This term, however, is misnamed and confuses common property with open access; it is actually the

''tragedy of open access'' that matters (Bromley & Cernea, 1989; Bromley, 1998).

In more recent literature, authors such as Wade (1988), Ostrom (1990, 1992), Tang (1992), Baland and Platteau (1996), Lam (1998), Agrawal (1999) and McCay (2000) have criticized the conventional approaches for solving this social dilemma as insufficient. It is neither sufficient to create a system solely of private property rights, nor is the only solution the central government's continued control of common resources. Ostrom in particular contributes to an empirically valid theory of self-organization and self-governance with regard to the problem of common-pool resources (Agrawal & Ostrom, 2001; Ostrom, 1990, 1992). All authors mentioned lead us to the understanding that collective action is a way for societies to overcome this dilemma and use a resource in a sustainable way. Ostrom (1990, 1992) developed design principles for long-enduring, self-organized common-pool resources systems. [1]

Several authors call for a broader view than these design principles developed by Ostrom. The common property scholars (Agrawal, 2001, pp. 1650–1656; Meinzen-Dick, Raju, & Gulati, 2002, p. 652) argue in favor of critical conditioning factors in terms of the environment—that is, the inclusion of physical, socio-economic, and policy environment. These can either facilitate or constrain organization, creating incentives or disincentives for people to work together. Schlager (2002, p. 815) states that the development of a satisfactory theory must be based on bounded rationality assumptions. Agrawal (2001, pp. 1650–1656) analyzed the work of Ostrom (1990), Baland and Platteau (1996), and Wade (1988) as three comprehensive attempts to produce theoretically informed generalizations on the conditions under which groups of self-organized users are successful in managing their commons dilemmas. Agrawal (2001) argues that the studies mentioned focus to a limited degree on resource characteristics or on the external social institutional and physical environment, such as questions of population and market pressure. The arrival of markets and new technologies in particular is likely to change local power relations as various subgroups dependent on common-pool resources gain different levels of access. The political weight of the various actors involved and the way benefits are distributed among them are bound to influence institutional innovation (Baland & Platteau, 1998). I will follow some of these critics by analyzing the impact of transformation-specific variables on self-organization.

(b) *Transition economics*

Influential features inherited from the socialist period and the transformation process may hinder collective action. Balcerowicz (1995, p. 167) also refers to inherited conditions as an important set of variables when analyzing transition processes.

(i) *Incongruity between formal and informal rules*

In transition countries, we observe a large discrepancy between formal political intentions and informal effective institutional change at the local level. The simultaneous change from a centrally planned to a market-oriented economy and from a communist to a democratic system created an institutional vacuum. This was due to numerous economic, political, and institutional constraints such as the unpredicted fall in output, unsuccessful stabilization attempts of the economy, limited law enforcement mechanisms, limited implementation capacities of formal rules, and weak public administration capacities (Roland, 2000).

The high incongruity between formal and effective rules provide conditions under which opportunistic behavior is able to grow and persist. Opportunistic behavior is understood here as different expressions of self-interest seeking with guile, including calculated efforts to mislead, deceive, obfuscate, and otherwise confuse (Williamson, 1996, p. 378). The rules-in-use and opportunistic strategies develop and change interdependently. This dynamic process can be illustrated as follows: First, rules-in-use pave the way for opportunistic strategies. The opportunistic strategies in turn change the rule-in-use, and the incongruity between formal and effective rules increases. Because of the higher incongruity, possibilities for opportunistic strategies increase once again. Second, opportunistic strategies appear and, in response, a certain rule-in-use develops. This effective rule is not congruent with the formal rule. The incongruity increases and the possibilities for opportunistic strategies increase once again. Finally, in the long run, growing incongruity enables a feedback that influences the development of the formal rules.

Shorter horizons in transition countries may also lead actors to behave more opportunistically (Blanchard & Kremer, 1997, p. 1123). According to Rose-Ackermann (2001, p. 417), Lavinge (1999, p. 271), and Balcerowicz (1995, p. 160), the transition process has created special strains of opportunism.

(ii) *Power abuse and information asymmetry*

Bates (1995) lays the framework for a very valuable theoretical discussion. His main argument is that new institutionalists suggest that people create institutions in an effort to move toward the Pareto frontier. Bates (1995, p. 42) argues: "The new institutionalists have been slower to acknowledge that the creation of economic institutions takes place not on the 'level playing field' of the market, but rather within the political arena in which some are endowed with greater power than others." New institutionalism should take into account the allocation of political power in societies and the impact of the political system on the structure and performance of economic institutions. When social dilemmas are solved and new rules implemented, some people benefit more than others. Indeed, some may even benefit at the expense of others. Bates calls for these outcomes to be explained with more political than economic analysis. Those groups with substantial economic and political assets may impede organizational efforts that could cut back their productive activities. The incentives within governments and the danger of government bureaucrats' abuse of power have often been overlooked in transition economies (Roland, 2000, p. 265). The impact of heterogeneity depends on how it is linked to expected benefits and costs of institutional change. Ostrom (2000, p. 42) refers to collective-choice rules that offer a small group of the elite substantial power to block suggested changes that may generate positive overall gains, but also losses for those in power. The powerful influence of distributive considerations should not be neglected. The way benefits are distributed among various actors involved and the respective political weight of the latter influence the likelihood of institutional change (Baland & Platteau, 1998, p. 649).

In the distribution theory of institutional change, developed chiefly by Knight (1992, 1995), the power asymmetries of actors represents the main determinant of institutional change (Schlüter, 2001, p. 89). This bargaining power is a function of their resource provision. In the broadest sense, power is the ability to determine the behavior of others in accord with one's own wishes (Koschnik, 1993, p. 789). Power strategy is defined as a mode of power use—i.e., the type of specific action that X chooses to get Y to do something (Koschnik, 1993, p. 794). Another significant source of power is the bargaining power of existing networks, which is of extreme importance in transition countries (Raiser, 1997). The nomenclatural effect is especially obvious here and refers to the fact that the former communist elite once again hold positions of power (Balcerowicz, 1995, pp. 54, 160, 355). Members of these networks usually have better access to information (Schlüter, 2001, p. 96).

The discussion focuses on corruption as one form of power abuse. Corruption is an significant expression of opportunism observed in transition economies (Roland, 2000, p. 187). The weakening of state control and the confusion among the population regarding proper behavior in a context of increased freedom may result in the high levels of corruption. In transition economies in particular monetary corruption is a replacement for the system of administered benefits based on connections. There are numerous studies on the reasons for corruption in transition countries (Lavinge, 1999, p. 271; Roland, 2000, pp. 188–189). Although ordinary people view corruption as a continuing problem it is nevertheless maintained (Rose-Ackermann, 2001).

Transformation requires a high degree of knowledge, not only because of the simultaneous processes occurring at all levels, but also due to its short duration (Schlüter, 2001, p. 6). This knowledge is not centrally accessible, but is decentralized and used by certain actors, e.g., a village water guard. Therefore, transition economists regard information and knowledge asymmetries as one important characteristic of transition (Lavinge, 1999, p. 272; Roland, 2000, p. 73). Blanchard and Kremer (1997), for example, stress the role of asymmetric information in explaining the decline of output production in transition countries.

The possession of advanced education, higher exposure to specialized media and other sources of information, or greater experience becomes important in environments of imperfect information. According to Koschnik (1993, p. 796), the reasons for unequally distributed power include factors such as control over the information flow of an organization. According to Knight's definition of power, information is

also a key resource. Information and information asymmetries are important in influencing actors' evaluations of individual alternatives, hiding institutional alternatives, or adding new alternatives (Knight, 1992, p. 46). Schlüter (2001, p. 99) even argues that Knight underestimated the significance of information and information asymmetries as a strategic resource in the process of institutional change; the knowledge difference among the actors may be immense. Transformation is a period with a high rate of institutional innovations. Information on these innovations is a scarce resource, which is distributed asymmetrically among the actors. Management of information is mostly defined in the sense of dealing with expert power. X might illustrate his expertise in some issues by providing background or inside information. The goal is to get Y to comply with a request, because X appears to know what he is talking about. In contrast, the notion of governance of information (Section 5) goes further than the above definition; it includes dealing with certain information that X has access to, which does not necessarily comprise information that credits him as an expert. Therefore, the possession of information and the possibility to govern information is one determinant of power abuse discussed in Section 5.

(c) *Deterioration of social capital*

Credible commitment is one aspect of social capital and an important factor in determining how new institutions evolve. Following Putnam (1993) and Paldam and Svendsen (2000), social capital, a prerequisite for collective action, was low during socialism and is still constrained in the transformation process. Empirical insights into deteriorating social capital are given in Section 6.

An indicator of the ability to self-organize is the development of the nonprofit organization sector. Voluntary or civic associations served state functions under socialism. The nonprofit organization sector is growing, even though a number of scandals during transition have tarnished the sector's reputation. Therefore, the weakness of nonprofit organizations is due to socialism's legacy as well as current institutional and legal weaknesses (Rose-Ackermann, 2001, p. 432). In general, organizational membership is low compared with the United States or Northern Europe.

Trust is an issue central to the transition process. Trust as social capital facilitates the provision of collective action and thus public goods (Raiser, 1997). Rose-Ackermann (2001, p. 415) describes two effects the past has had on societies in transition. First, the community has been dispersed by the move to the market and to democracy, leading to a loss of interpersonal trust and increased opportunism. Second, the socialist governments' lack of legitimacy has resulted in low levels of trust in public institutions and reliance upon interpersonal relations. Lavinge (1999, p. 94) and Raiser (1997) share this viewpoint, arguing that communism has left a legacy of distrust in public institutions that hampers the emergence of a market economy. During socialism, Bulgaria was a country in which the system of corruption encompassed a particularly large proportion of the population.

In her article, Rose-Ackermann (2001) analyzes the results of the "New Democracies Barometers," a survey covering 11 countries in Central and Eastern Europe and a data collection from Bulgaria, the Czech Republic, Slovakia, and the Ukraine. These surveys focused on trust, corruption, and understanding people's perceptions. Using the surveys, Rose-Ackermann (2001) describes a widespread skepticism regarding the trustworthiness of a range of different professions and institutions. There is a real risk of a vicious cycle—distrust breeding distrust. Transition economists claim that interpersonal trust is also much lower in transition countries (Raiser, 1997; Rose-Ackermann, 2001). A glance at the country survey reveals that the most distrustful, concerning personal relationships, in Central Europe are the Bulgarians and the Romanians. Moreover, their lack of trust in a range of institutions is not markedly different from that of their neighbors (Rose-Ackermann, 2001, p. 426).

Gephardt and Kamphausen (1994) conducted a sociological study on the differences in mentality between one West German and one East German village in the years following reunification. According to them, as prosperity increases, people become aware not only that social differentiation and individualism is growing, but also that envy—the arch enemy of every community—is taking hold of the hearts of their relatives, neighbors, and friends. (Gephardt & Kamphausen, 1994, p. 143). Envy as a transformation-specific feature has not gained a great deal of attention thus far;

however, empirical results show that it hampers collective action (Section 6).

(d) *The analytical framework*

More recently, Ostrom (2000) examined the underlying preconditions for self-organization that must be fulfilled in order to increase the likelihood of self-organization—the attributes of a resource and those of appropriators (Ostrom, 2000, p. 40). [2] At present, rural Bulgaria does not meet these preconditions for building collective action, since the appropriators are bounded rational and vary with respect to their assets, dependence on the resource, time horizons, trustworthiness, and their common understanding of how the system operates and the actions affect each other. According to Ostrom (2000), changes in these key variables account for a group's self-organization or their failure to achieve such collective action. In transition countries in particular, research has had to go beyond the study of design principles for long-enduring, self-organized common-pool resource systems and focus on preconditional behavioral attributes.

In this article I will complement explanations from Baland and Platteau (1998), Ostrom (2000) and Agrawal (2001) with findings from distributional theory of institutional change (Bates, 1995; Knight, 1992, 1995) and aspects of transition economics. The analytical framework sets the variables, determining possibilities for collective action in the context of transition (Figure 1).

The analytical framework provides the broader theoretical approach underlying this research. It shows the variables influencing collective action solutions for an irrigation sector in transition and the chief interdependencies among these variables; they are grouped into the dimensions: formal political settings, effective institutional settings, resource characteristics, and actor group characteristics. The relations to transformation-specific features—namely, the incongruity of formal and informal rules, information asymmetry, opportunistic behavior, and deteriorating social capital—are emphasized.

The incongruity of formal and informal rules and information asymmetry are typical for a transformation economy and facilitate a milieu in which opportunistic behavior can persist. Opportunistic behavior, or power abuse, leads to deteriorating social capital. The interdependencies between power abuse and low social capital represent a cycle of self-reinforcing processes that constrain collective action. The combination of variables relevant for an individual actor modifies her/his decision in favor of or against new institutional rules, discussed here as a collective action solution.

The empirical study concentrates on the transformation-specific variables: the incongruity of formal and informal rules, information asymmetries, local power abuse, and deteriorating social capital. The empirical results support the assumption that these variables will lead to behavioral attributes that need to be analyzed more carefully in terms of their influence on the likelihood of self-organization in Bulgaria's irrigation sector. As empirically analyzed in Section 5, governance of information and corruption are means of power abuse. Experiences from the socialist period and the transition process result in specific actor characteristics, such as distrust and envy, perception of corruption, and the assessment of collective action, all of which are analyzed as social capital measures (Section 6).

3. FIELD WORK METHODOLOGY

Institutional change is a process and should be analyzed with a dynamic research methodology. Following this assumption, the study is based on six months of empirical fieldwork subdivided into three phases spanning two and a half years. Qualitative research methods predominate this study. In addition to interviews with experts in Sofia and with representatives of the regional administration level, case studies proved to be a useful method for answering research questions (Yin, 1994). Two kinds of case studies were conducted: In the first research phase, 17 village case studies provided an overview of the irrigation situation in the villages and allowed for a rough analysis of the main hypotheses. Four in-depth case studies were carried out in four villages, which provided more specific and detailed information. In order to study the process of institutional change, three of these four villages represent a subset of the 17 villages and were studied throughout all three empirical phases. The remaining village was studied in the last two empirical phases, which corresponded to two irrigation seasons.

The results analyzed in the frame of this paper are explicitly based on the in-depth case studies. Information of expert interviews and of

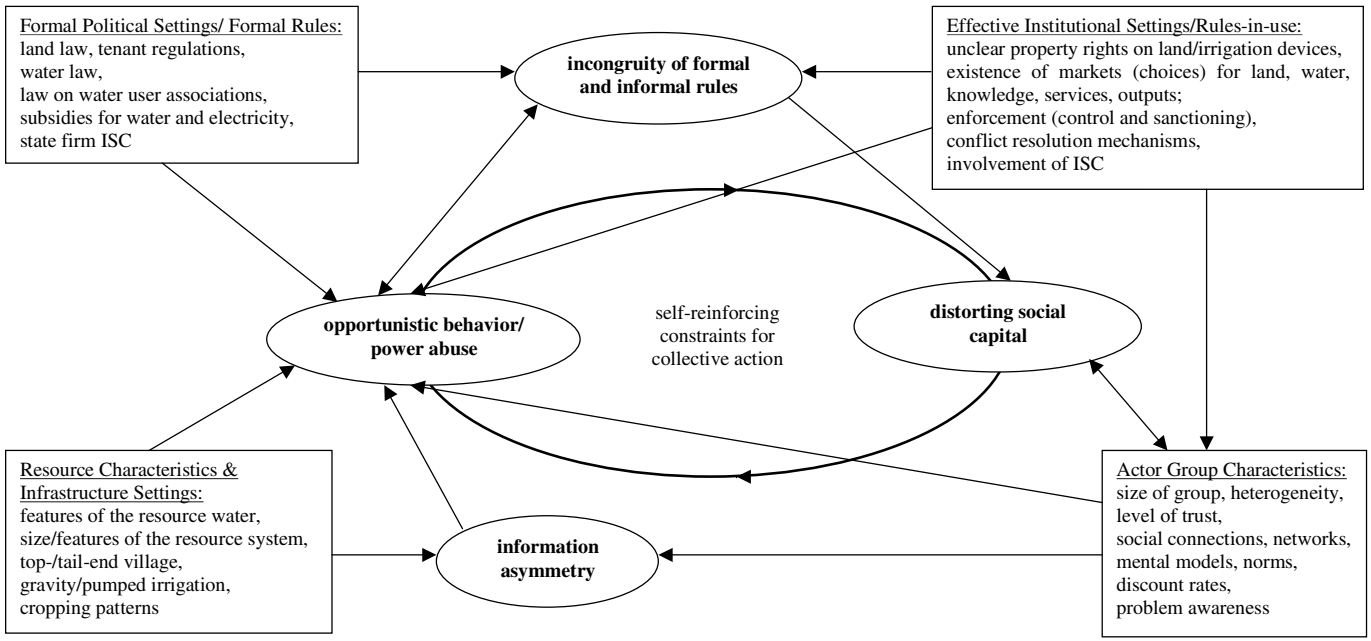

Figure 1. *Variables influencing collective action for an irrigation sector in transition.*

the explorative case study phase do contribute implicitly.

(a) *Selection of the study site*

Seventeen village case studies were conducted in three regions of Bulgaria exemplary in their natural soil and water conditions, their farm and crop structures, and the size of their irrigation facilities. The study included five villages in the northern region of Veliko Tarnovo, four villages in the Pavel Bania region of central Bulgaria, and eight villages in the southern region of Haskovo. To gain an overview and collect statistical data from each region, several interviews were carried out with experts at the regional level—for example, at the Irrigation System Company (ISC) state firm and the District Agricultural Office. To begin with, the interviewees were key persons such as the mayor, the managers of cooperatives, or tenants. As a second step, farmers were chosen by random sample and interviewed to verify the information gathered.

Based on the empirical work in all three regions, the Haskovo region was eventually selected to undergo intensive empirical research. By choosing the Haskovo region, distorting variables could be excluded from the in-depth case studies. These variables include huge irrigation catchment areas supplying a large number of stakeholders, tenants or cooperative farms holding the majority of land, crop structure that is less dependent on irrigation, and inefficiency of pump irrigation due to energy costs. The Haskovo study site has smaller irrigation catchment areas with a definite number of actors. In contrast to northern Bulgaria, there are more medium-sized family farms producing fruits and vegetables, a production heavily dependent on the reliable and timely provision of irrigation water of sufficient quality and quantity. Parts of the irrigation infrastructure in the Haskovo region are based on gravity irrigation, a large proportion of which could be managed by the water users themselves. This would imply that the water user associations do not depend exclusively on external financial assistance, which would add another set of external actors and relationships. The selection of this study site offers more favorable possibilities for establishing new institutional rules, discussed here as collective action solutions. It is important to exclude distorting variables from the study and to limit the investigated variables that constrain collective action. Two irrigation catchment areas were selected in the Haskovo region. In each area, two villages were chosen as in-depth case studies, with one village located directly behind the water dam (top-ender) and the other further back—at the middle or tail-end of the canal and river system. Further selection criteria concerned various farm structures and the status of establishing water user associations. In this article I deal with sensitive issues of distrust, opportunistic behavior, and bargaining power. In order to guarantee anonymity of the individuals involved, Table 1 presents abstracted abbreviations used in this article as well as the location of the villages within the irrigation catchment area.

(b) *In-depth village case studies*

One stipulation for the valid and reliable collection of case study data is triangulation. Triangulation is the use of multiple sources of evidence (Yin, 1994, pp. 90–94). This facet is the major strength of and advantage to a case study strategy. Data triangulation and methodological triangulation were used in the research presented here. As Potter states (1996, p. 94), active, participative observation combined with qualitative interviews are the most valuable methods of gaining information deemed sensitive by an actor and observing of an actor's unconscious behavior. This combination of methods was the basis for the in-depth case studies.

During the second and third research phases, I lived with families in the respective villages over a period spanning five months, which offered access to various kinds of informal information, such as the frequency of meeting with neighbors to discuss agricultural production practices. Trust had to be established, which was facilitated by such an ethnographical approach. Once the villagers accept the researcher, it is possible to participate in numerous activities from which outsiders would otherwise be excluded. For example, in one of the villages, I had the opportunity to partici-

Table 1. *Location of the villages*

Village	Location in the irrigation catchment area
Village A	Top-end position, first catchment area
Village B	Tail-end position, first catchment area
Village C	Top-end position, second catchment area
Village D	Middle position, second catchment area

pate in a village assembly that was held to establish a water user association. Later, I learned that this was the first time in village history that an outsider had participated in a community event.

Key figures—such as the mayor, the water guard, the ex-secretary of the Communist Party, the cooperative managers, the big tenants, or the shopkeepers—were interviewed with an interview guideline.

In the second and third empirical phases, approximately 20 formal interviews using a partly standardized questionnaire were conducted in each village. Two-thirds of the questions were open questions following an interview guideline that differed according to the various actor groups. The second questionnaire was based on the findings from the previous year. The households interviewed were chosen to allow for a sufficient representation of actor groups, as with agricultural producers or irrigation water appropriators, and represented different farm types and sizes, political party support, age groups, and ethnicities (here the Gypsy or Turkish minorities). In order to analyze the process of local self-organization, an attempt was made to question the same interviewees with the second standardized questionnaire.

A specific interview guideline, analyzing the rules-in-use for irrigation, was used to interview several water users and the water guards in each phase. Ostrom, Gardner, and Walker (1994, p. 12) favors this method: ''The rules are never written down. Outsiders may have no idea—unless they ask quite specific questions...'' Informal interviews were held in coffee shops, on the fields, or whenever the researcher met with villagers. In addition to observations and interviews, great emphasis was placed on the inclusion of participatory research methods, the most valuable of which were map drawing, ranking of important actor characteristics, and group discussions.

Qualitative content analysis based on Mayring (2000, p. 472) was used to analyze the empirical material in Section 5, and the technique of inductive category building was chosen. This technique develops step-by-step categories from the empirical material gained from open questions. Categorization is one method of coding multidimensional answers and clustering the segments relating to a particular research question (Miles & Huberman, 1994, p. 57). Basic statistical analysis leads to the data presented in Section 6.

4. INCONGRUITY OF FORMAL AND INFORMAL RULES

The theoretical discussion shows that, if high incongruity between formal and effective rules exists, it provides the conditions under which opportunistic behavior can grow. Certain resource and resource system characteristics, actor group characteristics, and a high level of information asymmetry facilitate a milieu of opportunism. In the following section, the incongruity of formal and informal rules for the tail-end village B is analyzed using empirical material. Similar expressions of incongruity were observed in all cases. Village B therefore represents a typical example.

This section is based on the following definition: ''Rules provide information about the actions an actor 'must' perform (obligation), 'must not' perform (prohibition), or 'may' perform (permission) if the actor is to avoid the possibility of sanctions being imposed'' (Ostrom *et al.*, 1994, p. 38). All rules are the result of implicit or explicit efforts to achieve order and predictability among humans. According to Ostrom *et al.* (1994, pp. 37–50), an institutional analysis relevant to field settings requires the understanding of the working rules, or rules-in-use, used by individuals. Most formal analyses focus primarily on the structure of an action situation, which the authors refer to as the surface structure of formal representations (Ostrom *et al.*, 1994, pp. 37–50). Rules-in-use govern the patterns of interaction among the different actors in the system and represent the set of rules to which participants would refer if asked to explain or justify their actions to fellow participants. Interviewees, however, do not explain their actions to outsiders in the same way they explain them to fellow participants. Beyond that, following a rule can become a mechanical social habit that goes unmentioned in an interview. In order to cope with these problems, the empirical methodology was expanded by participant observation techniques (see triangulation in Section 3).

As will be shown, the limited sanctioning and enforcement mechanisms as well as practically nonexistent monitoring mechanisms provide favorable conditions for opportunistic behavior.

(a) *Foundation of a water user union*

The agricultural area of village B encompasses 1,550 hectares. In 1960, nearly 100% of

the agricultural area was irrigated by pump irrigation and gravity irrigation. In 2001, less than one-third of this area was irrigated, and then only with gravity irrigation. A water user association, founded by nonvillagers, exists on paper. Before the Water User Association Act was enforced, vague regulations in the cooperative law enabled nonvillagers to set up such associations. This was often done to profit from the water fees paid and from financial aid without investing in the infrastructure. The villagers find this foundation inscrutable. (In an interview, for example, the head of this organization refused to name the other members.) Most of the villagers are unaware of the possibility of establishing a water user association or even its formal existence in their village. The villagers speak of this association either as a private water firm or as a tenant who has rented the canal system. The villagers are only aware that the water guard is from their village; they have no idea of the other parties involved. Since there is at least one connection to a villager, however, an uncertainty and uneasiness in discussing this topic was evident during the study. Given that villagers know hardly anything about the water user association that formally exists, however, the situation is closer to one of open access, with efforts by a formal institution to exert some authority. The discussion on effective water ordering and appropriation rules shows that this is not an effective entity.

(b) *Water ordering*

Water users have to place an order in advance with the water guard if they want to irrigate. The formal rule states that the guard must collect a certain amount of orders before he can open the barrage and fill the canal with water. Nevertheless, compliance with this rule varies. Informally, no farmer can depend on irrigation water via canal, even if he orders it.

Another issue is that usage rights for the canal system and the water dam belong to different people. In Bulgaria, dams are often rented to private individuals, who farm fish in the reservoir behind the dam. Formally, the stock of fish should not reach a level that would initiate a competition for water between irrigation and fish farming. Although farmers in village B wanted to irrigate—and several even ordered water—the tenant of the water dam did not divert water into the canal or river. Based on this situation, the informal rule appears to be: when the canal is filled, irrigate to be on the safe side, whether or not you have ordered water. The "first" formal rule—a farmer who orders water and pays in advance has the right to irrigate—does not work in practice.

When water is scarce and farmers, despite their orders, do not receive water via canal, some may join together and engage in a "rebellion," as they call it: a group of them go to the barrage and open it themselves. This rebellion generally leads to fights.

(c) *Appropriation rules*

One statement, taken from an interview, summarizes the "second" rule regulating the sequence: "Whoever is ahead of you at the canal is the first to irrigate. That is the law." This is a common situation; farmers who extract water from the head of an irrigation system can obtain more water than farmers who are located at the tail end (Ostrom, 1990). Most of the interviewees described the situation as chaotic. The problems of water diversion among neighboring villages are the same as those of small-scale water users sharing one canal. A typical situation involves a tail-ender ordering water. The canal is filled. Everyone ahead of him irrigates and the tail-ender faces water shortage, even though he ordered the water and may have even paid for it.

The "third" rule of irrigation from one canal is specified by physical strength. Physical violence among the users of an irrigation system is symptomatic of inadequate assignments of spatial or temporal slots to appropriators.

(d) *Monitoring*

There is almost no monitoring system for water appropriation. This chaotic situation leads to farmers guarding their fields around the clock. First, farmers wait for the water in the canal to reach their plot so that they can immediately start irrigating before another farmer begins. Second, they must supervise while irrigating, otherwise another farmer diverting water from a top-end position can begin irrigating, leaving them insufficient water to complete their irrigation run.

Water storage basins are filled overnight to secure the availability of water in all villages belonging to one irrigation catchment area. If water flows into the canal system at night, it in turn motivates farmers to irrigate at night, often in an attempt to avoid payment. Such

"black irrigation" is usually discovered by daylight, but farmers simply claim that neighboring farmers flooded their fields, which cannot be proven to the contrary.

(e) *Excludability and sanctioning*

Water users who have not paid the water fee cannot technically be excluded from water diversion from a canal. There is no graduated sanction mechanism, as is described by Ostrom (1990, 1992) in her design principles for enduring, self-governing, common-pool resource institutions. Only one water guard works in village B. This plain figure represents no authority. Formal sanctioning power is largely missing. Nevertheless, he makes use of social sanctioning measures to force people to pay the water price; as an embarrassment to the water user who did not pay, he shouts in front of their house so that everyone can hear who has not paid.

5. POWER ABUSE

The analytical framework indicates incongruity of formal and informal rights, information asymmetry, low social capital, and certain actor group characteristics as transformation-specific features that build a basis for power abuse. Power abuse is the opportunistic behavior of central actors, expressed in different forms appropriate to the actors involved. Certain resource characteristics and infrastructure settings can support the power abuse strategies of individual actors. Power abuse is a transformation-specific feature that has a strong and direct impact on the individual actor's decision in favor of or against collective action and a negative impact on social capital development, otherwise known as facilitating collective action. Governance of information and corruption are discussed as two different strategies in taking advantage of local power asymmetries.

(a) *Governing of information*

Referring to the theoretical introduction, possession of information, and therefore the possibility to govern information, is one determinant of power strategies.

I will start this section with an example from village C, the second top-end village, where a village assembly was held in order to commence the establishment of a water user association (WUA). This example illustrates one way of governing information, i.e., the decision on how to distribute information. According to the mayor, villagers were informed about the idea and its advantages at the meeting, during which an initiative committee was elected to start the procedure. This is in line with the procedures outlined in the Water User Association Act, specifically Articles Six and Eight. The mayor declared that approximately 300 participants gave their names, passport numbers, and their written consent to the establishment of an association. This number represents one-third of the village's 1,000 inhabitants.

What follows is an analysis of the way in which the mayor channeled information about this village meeting to the desired participants. The mayor informed the villagers of the meeting's content via the local cable radio. The question here is who could be reached via this medium? During the socialist period, the cable radio was a propaganda tool, and only one station came in—the national one. Furthermore, the program was frequently interrupted with information provided by political leaders. It was a common understanding and a political imperative that this radio was on all day. One 66-year-old interviewee stated: "I always had my cable radio on. The national program was interrupted when the mayor informed us of something."

In village C, the farm structure is very diversified, ranging from small subsistence farms to medium-sized tenant farms to large cooperative farms. There are five to six medium-sized agricultural producers who operate between 10 and 36 hectares, young tenants who would like to expand their production. They have already invested in equipment, have the appropriate know-how, and could be characterized as producers with a future perspective. They cultivate crops that need to be irrigated, mainly tobacco or pepper. This group represents the private water users in the village, and none of them knew about this village meeting; therefore, they were not involved in the planning of the WUA. In addition, those producers who irrigate their fields guard them around the clock and have no opportunity to stay at home and listen to the radio. Moreover, young families representing capable entrepreneurs who have moved to the village or live there part-time, during the agricultural season, may not

listen to the old communist-style cable radio. Based on their pessimistic and skeptical evaluation of this method of founding a WUA—i.e., without the water users—it could be assumed that they have other, better alternatives. This is emphasized by the fact that none of them seemed disturbed about missing the meeting. At this point, one can only speculate on whether they have options to bilaterally bargain about the water price they pay to the local branch of the state firm ISC, which holds a monopoly on the irrigation water supply. If this were true, the idea of establishing a WUA would not be in their interests.

The following examples back up this argumentation. An interviewee stated: "At the meeting there were people who do not engage in agriculture and who are not farmers." A 76-year-old man who participated in the meeting and signed the list has no land in the village and does not produce on somebody else's fields. Still, he regards himself as village member and had heard through the cable radio about the meeting. He does, however, admit in the same interview: "I do not know about the level of the water price. I am far from those problems." Mainly older landowners, who neither produce nor use water, attended the meeting, but there was also a certain selection among them. The candidate of the "Blues" from the last mayoral election made an interesting statement. (The color refers to his political association: "Blue" stands for Union of Democratic Forces.) He did not know about the meeting: "Was there something like that? I do not know anything about it." His wife interrupted: "He usually participates in those kinds of events." He continued: "My radio has been out of order for some months. Usually those announcements are made through the radio. But if they really need me, they'll find me." The majority of the participants were supporters of the "Reds," the Bulgarian Socialist Party (BSP), who are former communists. The mayor also belongs to the BSP. The result of all this is that the elected initiative committee to establish the WUA represents the power holders of the former communist party.

This example demonstrates that the control over information and, hence, the possibility to distribute it in a directed way—i.e., deciding where it is announced—is a means of power. It can be concluded that the mayor successfully chose the proper distribution channel to reach those who will help him to enforce his ideas.

In the subsequent section, all villages are analyzed for the governance of information with regard to water price and water supply on the supply side, the ISC in Haskovo, or the "pseudo" WUAs.

Only 22 of the 79 probationers felt capable of answering the following questions: How is information passed on about the irrigation system, the availability of water in the canals, the urgently needed repairs, and the water price? Eight respondents answered that information about the water price can be had from the water guard; however, two of this group argued that this has to be done at the canal, as the guard can only be found there. In this context, it should be mentioned that not one of the water guards in all four villages has a phone. Three probationers stated that information can be obtained from ISC in Haskovo and seven mentioned both sources—ISC in Haskovo and the water guard. In village B, the situation is marginally different; as probationers additionally mentioned the information sheet that was posted on the post office door. One interviewee complained that there was no place to become informed about irrigation and two respondents admitted that the visible situation at the canal provides the only information source. "It's only known that the main canal will be filled with water. That's all." Another one added: "The gathering of information is very difficult."

The water price represents a major share of the costs for production means. Therefore, knowledge about the water price was analyzed from 39 probationers in all four villages: (i) *Is there a water price? What is it?* (ii) *Do you know how it is calculated?* (iii) *Does the price stay the same once it is announced or does it change?* According to the technique of inductive category building, it can be shown that a share of 72% of the interviewees had information on water prices. Approximately one-fourth, however, complained that they do not know how the price is actually calculated. A share of 8% still does not know the price for the current season. Farmers complained about the fact that they are told about it very late, i.e., after having made crop decisions or even after having planted crops. There was not one farmer who possessed information about the calculation of the water price according to costs from the suppliers. But at least some were aware of their lack of information. A quotation from a small farmer serves as a summary: "The ISC speculates about information on the water price."

Summarizing these findings concerning governance of information reveal five power strategies:

—Distributing information in a directed way
—Using only limited information channels
—Distributing vague, confusing information
—Distributing information late or too late
—Withholding information

The first part of this section explained the distribution of information in a directed way that enables the sender to reach certain target groups. Passing on information to those recipients who support the idea and excluding critics can help to enforce decisions in the senders' favor. The second strategy is to use only limited information channels. Without different informational sources for the same fact, there is no chance to crosscheck it. A share of 82% of the villagers mentioned either the water guard or the ISC in Haskovo, or both, as the only informational sources for the price of water. From the standpoint of the information sender, it is easier to influence the distribution and the facts themselves if channels are limited. The third strategy is maintaining chaotic, unclear situations; these fuzzy information situations are a precondition for opportunistic behavior and corruption networks. The fourth strategy leads to high planning insecurity for the farmers, keeping them dependent on the water suppliers. The intention here is similar to the third strategy. The fifth strategy is also widely practiced; e.g., it was impossible to get a look at the ISC's budget in Haskovo. The price of a good is usually calculated by at least covering its production costs. These five strategies offer insights on how the governance of information paves the way for power networks, and possibly, opportunistic behavior.

The example of the head of the village B water user association combines these strategies with the use of personal connections. He takes advantage of the information asymmetry that exists between him and the villagers. He is also the leader of the Youth Organization of the Peasant Party. Holding such a position, he has access to various kinds of information. He participated in a course offered by the World Bank, where he learned how to establish water user associations under the cooperative law. He used his powerful position, good contacts, and supplemented knowledge to establish a water user association and retain his position. Since maintenance work is reduced to a minimum, he uses his position to gain extra income from the collection of water fees. In addition, the prestige he has earned by establishing a WUA furthers him in his career in politics.

(b) *Corruption*

Corruption is another power strategy occurring quite frequently in irrigation systems, because irrigation institutions create many such opportunities. One form of corruption in the irrigation sector is withholding the delivery of water to those who are entitled to it in order to collect illegal payments of money, commodities, or special favors.

Certain key positions offer the opportunity for exploitation. Bribes can be paid to have water in the canal on time. This is however, more common for larger producers with crops such as peppers, which suffer yield losses if not promptly irrigated at a certain time. Paying bribes to receive water on time are calculated costs. In such cases, the canal is filled for only one producer, despite the existence of the formal rule that several orders from appropriators must be collected before the barrage is opened.

There are many opportunities for corruption in the manner in which the water price is calculated and collected. Different forms of nontransparent water fee collection were observed in all four villages. For example, the Village B water user association adds two Leva hydromelioration tax to the water price for each irrigation run. The only informational source on this tax is the water price information sheet, a little sheet of paper glued to the door of the post office. This sheet shows the water price for the season. It explains that this tax is added to each irrigation unit. The villagers speculate among themselves as to what this tax is for.

Another opportunity for corruption is the guard's provision of receipts. The water price for one bout of irrigation per 0.1 hectare pepper may, for instance, be 15 Leva. A farmer may be asked to pay only 10 Leva and then receive a receipt for five Leva. In addition, water users that are personally close to the water guard can pay the water price later at a point in time, when they have sufficient cash flow.

6. DETERIORATING SOCIAL CAPITAL

A characteristic of actor groups fostering collective action solutions is that most appropriators must share generalized norms of reciprocity and trust that can be used as initial

social capital. Property rights scholars often underestimate the role of initial social capital. As it lowers the cost of working together, social capital facilitates co-operation (Baland & Platteau, 1998; Ostrom, 1990; Pretty & Ward, 2001). Collective action needs credible commitment, and one decisive requirement for credible commitment is trust among actors. When a society is pervaded by distrust, co-operative arrangements are unlikely to emerge. Transition economics argues that experiences from socialist times and the transition process have resulted in deteriorating social capital and specific actor characteristics that constrain the possibilities of collective action and the provision of public goods. This section attempts to indicate the impact of low social capital on collective action in the irrigation sector. The argumentation highlights the importance of complementing collective action theory with transformation-specific characteristics.

This section focuses on distrust, envy, and the perception of corruption, which hamper credible commitment. Additional social capital measures are presented, and the attitudes against collective actions are analyzed. The information in this section sheds light on the local availability of social capital.

According to Paldam (2000), other well-known measures to elucidate social capital are the Putnam's Instrument (Putnam, 1993), the Payoff Question, the General Trust Question, and the Network Density Measures. [3] Many social capital scholars distinguish between good and bad or positive and negative social capital (Paldam & Svendsen, 2000). The measures above can be classified as approaching good social capital, whereas bad social capital is mainly tested by proxies of corruption perception as an indicator of the degree of the phenomenon.

(a) *Special trust and perception of corruption*

This section draws on Paldam's (2000) classification of social capital into:

—trust, which can be divided into generalized trust and special trust—such as trust in the law enforcement system, trust in the political and administrative system, and local trust;

—cooperative ability, which refers to people's ability to work together; and

—the density of voluntary networks.

According to Paldam's classification (2000), standardized questions were included in the third phase of field research to assess "special trust" in formal organizations. In addition, inquiries were made about the perception of formal actors' corruption. One questions was: *Whom do you trust?* A list of organizations was presented, starting with national formal organizations and ending with local authorities.

Figure 2 shows the results of a sample of 52 interviewees. The generally low level of trust in formal organizations is astonishing. There is almost no trust in the parliament, the government, the court (0%), and the district administration. The average trust in local authorities is higher than in any of the formal authorities at the national level, but still remains low. Only trust in the "blue" cooperative reached a share of over 50%. A share of 46% of the interviewees does not trust any formal authority at the national level and 19% does not trust any local actor.

Another question was: *In your opinion, how many members of the following organizations are corrupt?* The scale ranged from "none," "a few," "many," "the majority," to "everyone," and "I do not know, or no answer." The same list of formal organizations and authorities was presented. The all-village distribution of relative frequencies of a sample of 42 interviewees reveals that the majority of members of the parliament, and especially of court members, are considered corrupt. With regard to the corruption of local authorities, 26% named the mayor, 33% water guard, and 43% the "red" cooperative manager.

Moving from the local to the national level, the Corruption Perception Index (CPI) is another measure for social capital, which ranked 91 countries in 2001. The score relates to perceptions of the degree of corruption as seen by business people, academics, and risk analysts. Bulgaria was ranked 47 in the 2001 country ranking (Transparency International, 2001).

(b) *Distrust and envy*

In this article I investigate the possibilities and constraints on collective action after a 12-year transition period in Bulgaria. What roles do interpersonal trust and envy play in rural Bulgaria? Empirical results reveal that distrust and envy are prevailing characteristics in the researched communities. Interview quotations represent just one way of analyzing these behavioral attributes. Another method of analysis is to observe certain patterns of behavior

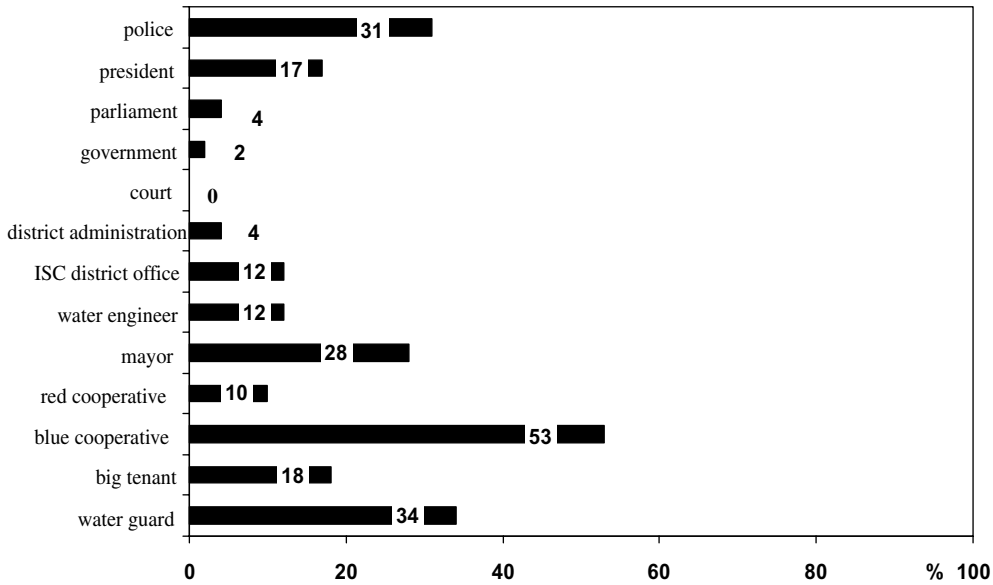

Figure 2. *Share of local people with trust in formal actors.*

and action, thus exploring people's unconscious, whereas mentioning facts during interviews reveals the level of consciousness. Much more elucidating is the unconscious, which can only be ''observed'' during certain actions. Lüders (2000, p. 391) distinguishes between: (i) experiences recalled by people in interview situations and (ii) actual experiences observable by the researcher during participant observations. Therefore, method triangulation combining interviewing and participant observation is very appropriate. The following analysis of empirical material draws on this distinction, as both approaches are used and, beginning with the second approach, actual experiences observed and participated in. Some of those events are supplemented by quotations from interviews that relate to the same action or behavior. In addition, a difference is made between external and internal relevance. External relevance expresses distrust and envy against outsiders that do not live in the village community, such as traders and water suppliers. Internal relevance characterizes the impact of the action on the relationship among the members of the village community. Both are important to establish a WUA from the bottom up, hence internal and external community relations refer to different levels of interaction. Actions and behaviors interpreted as signs of distrust are listed in Table 2. Actions and behaviors expressing envy can be found in Table 3. The analyzed expressions are not limited to the irrigation sector.

In some cases, the described distrust can also be interpreted as connected with the lack of trust in the enforcement of known official rules. Referring to point (i) the following section offers experiences recalled by people in interviews. The examples illustrate distrust toward village community insiders.

—Some farmers joined together to buy a combine. Later, they had heavy disputes, including the use of firearms. One of them felt as if he had worked more than the others. After the fighting, the co-operation was cancelled.

—At the mayor's office, a farmer requested having his meadows mown, a service for which he paid. In return, he received a number but no receipt. He argued with the mayor that the mowing payment is revenue that requires an analogous expenditure in the mayor's bookkeeping. The mayor was said to have answered: ''We do not need this. This is the way we do things here.'' The farmer interpreted his experience as such: ''If even the mayor violates the law, how are things supposed to improve in the village?''

—A farmer explained: ''Workers of the cooperative harvested corn, loaded it into a

Table 2. *Experienced distrust*

Action and behavior expressing distrust	Village[a]	Experience	Relevance[b]
Reimbursement of fees Farmers paid for their water in 2000. Due to a drought late in the season, the Ministry of Agriculture passed a regulation making water for gravity irrigation free of charge. Water users are still awaiting and discussing their reimbursement. "We did not get our money back from the Mafiosi WUA."	C	Actual	ex.
Irrigation pipes from the river The wells in the household plots are not sufficient for irrigation during the summer. Therefore, the plots are irrigated with pipes from the river. Every ten share an individual underground pipe from the river to their plot in order to secure water access during drought periods. The plots are located in one geographical line leading from the river. Instead of one joint pipe with junctions for each plot, there are ten individual pipes, which is much more expensive and requires more maintenance. "I want to have water, when I need it," was the argumentation.	B	Actual	in.
Guarding the fields Many farmers guard their fields, often armed and overnight, to prevent fruit, such as melons, from being stolen.	C	Actual	in.
Irrigation practice When the water in the canal passes a farmer's field, he will immediately begin irrigating, regardless of whether his crops need irrigation. People are reluctant to rely on water ordered for a future date. There is a very high risk that others closer to the canal will start irrigating, even if it is not their official turn. Brawls are often the result (see rules-in-use). "Many irrigate without the need for it."	B	Actual	in.
Advance payment Water users do not usually pay their water fees in advance, even though this is the formal rule. Nobody can rely on water being accessible on the same day on which it is ordered and paid for. Therefore, the common practice is paying only after having actually irrigated. The guard notices which farmer is irrigating, and it is his job to collect the fee afterwards.	B	Actual	ex.
Destroying the canal Some water users drill holes into the concrete plates of the canal in front of their fields to access water directly. Nobody digs a furrow up to the next iron weir, i.e., the official water diversion point. The lack of interest for their neighbor's fields, which might be flooded, or other water users who want to irrigate at the same time is obvious.	C	Actual	in.
Damming up water Some water users build high barriers to dam up the water above irrigation level in the canal so that neighboring fields are flooded.	C	Actual	in.
Breaking formal rules The water guard closes an irrigation diversion to a farmer's field. He must then remain on guard until the farmer has gone home. If he neglected to do this, the farmer would immediately recommence irrigating.	A	Actual	in.

Table 2—*continued*

Action and behavior expressing distrust	Village[a]	Experience	Relevance[b]
Guarding water storage basins A particular farmer's will arm himself to guard the water storage basin during the night before it is his turn to irrigate with water ordered and paid for; he has to be on his guard to prevent someone else from using the stored water overnight. If he does not, he will not have enough water the following day, even though it is his official turn.	A	Actual	in.
Rent for fallow The tenant does not pay rent for fallow plots. According to the law, he has to pay five Leva/0.1 hectares.	B	Actual	in.
Guards from the municipality There is an official regulation that six Leva/hectare should be paid to the municipality in order to employ a guard for the fields during harvest season. Nobody obeys this regulation. Tenants in particular prefer to employ their own guards, despite the higher expense.	D	Actual	in.
Village assembly At the village assembly for establishing a WUA, the participants quarrel about the members of the initiative committee. They insisted that those members only want to make themselves rich.	A	Actual	in.
Tenants of the water dam Farmers cultivate crops on plots that are irrigated from a small water dam. The tenants of this water dam did not release water in the year 2000 and the crops dried up. In 2001, the dam is still leased and, in the hollow that is filled from the dam, there is only melted snow from the previous winter. There is no sign that the tenants will release water into the hallow during the current season.	B	Actual	ex.
Faked seeds Farmers present stunted fruits, e.g., peppers that are too small and only light green in color. These abnormalities are due to fake seeds that they have purchased from traders. Three months after planting, farmers can tell if they have been cheated.	B	Actual	ex.
Trader's behavior A buyer visits the farmer at his field to inquire whether the farmer wants to give him cucumbers again to sell at the market. This buyer still owes the farmer the payment from the last season. "How can I trust somebody like that? The buyers cheat on the producers."	D	Actual	ex.

[a] Villages A, B, C, D.
[b] ex.: external, in.: internal.

truck, and immediately carried it away [without weighing and announcing the yield]. How are we supposed to develop trust? They do business for themselves. In Bulgaria nowadays there is only larceny—from corn to everything."

In the next section, incidents of envy are explored. Envy is much more hidden in actions than trust. The interviewees' corresponding comments should be taken into account to facilitate the interpretation of these actions within the context of envy.

The following are several additional quotations that shed light on the extent of envy among local citizens:

—"As to the mentality in the village, everybody is envious and skeptical. When you express an idea for the first time, everyone is against it. Local leaders cannot emerge in such a climate."

Table 3. *Experienced envy*

Action and behavior expressing envy	Village[a]	Experience	Relevance[b]
Destruction Small farmers are envious of tenants. Small arbors that tenants built in their vineyards have been destroyed several times. Some do not want to rebuild these arbors any more, as it is too expensive to have them guarded.	C	Actual	in.
Rent level The co-operatives are envious of the private tenants. The more land the tenants rent from the co-operative, the higher the rent is. "Nowhere else in the world do such things happen."	C	Actual	in.
Incendiarism The tenants are envious of one another. The crop fields of the big tenant were burned down. "The tenants burn down one another's fields. A tenant's combine was also set afire because the neighbor had too many losses. It's all about envy. Tenant X worked better soils than tenant Y."	B	Recalled	ex.

[a] Villages A, B, C, D.
[b] ex.: external, in.: internal.

—"People are very envious in our village. This envy causes, for instance, people at the front of the canal to irrigate too much. Therefore, whoever is further back in line has bad luck. As financial means are very limited, people are very envious, [people are] like wolf to wolf."
—"Everyone is happy that our tomatoes are sickly and that we may go bankrupt."

(c) *Assessment of collective action*

In terms of method triangulation another way to analyze the actors' attitude toward collective action is via direct questions. One purposefully provocative question asked on the standardized questionnaire was: *If you hear the words "collective action," do you have spontaneously positive or negative feelings*? [4] *Why*? An analysis of the answers of 78 probationers in all four villages can be summarized as follows: 47% of the interviewees answered negatively; 14% did not understand the question; and 38% answered positively. In the following, first negative and second positive, extracts are given of the interviewees' recurring arguments:

—At the moment, Bulgarians have no desire for collaborating; Bulgarians are not grown for joining something; as far as the Bulgarians are concerned, the period of collaboration is over.
—Irrigation is the responsibility of the State; the State should take care of it.
—People are not able to do something like this; they are too old; there are too many old widows.
—I want to work 100% individually; I am sick of cooperatives and collective working; I want to be responsible for myself; at the moment it is better to work alone; I am not interested in what other people do; I only care about how my own things are doing.
—You cannot trust anybody; people are behaving like animals; there is no trust in collaboration; people have been lied to from all sides over the last 10 years; collective leaders only want to gain profit and make themselves rich.
—I have positive feelings, if professionals were able to cooperate, they could enforce their interests better.
—Those who collaborate believe in the future; if there were trustful and serious initiators, I would join.

7. CONCLUSIONS

In the four case studies presented, transformation-specific features that constrain collective action solutions for common-pool resource management in Bulgaria's irrigation sector were apparent. It remains questionable whether measures that facilitate local self-governance can be successful in Bulgaria. The current formal attempts do not fall on fertile ground where collective action can grow. A system of inter-

relations has evolved between certain variables that influence individual decisions in favor of or against collective action. They are grouped into four dimensions: (a) formal political settings, (b) effective institutional settings, (c) the actor group characteristics, and (d) the resource characteristics and infrastructure settings. If these determinants are analyzed within the context of transformation, transformation-specific variables can be distinguished: the incongruity of formal and informal rules, information asymmetry, opportunistic behavior preserved via power strategies, and deteriorating social capital.

Individuals use their power to maintain opportunistic strategies and consequently do not agree to change any rules. The chaotic water appropriation rules currently in place are deliberately misused by a few powerful people for their own profit making. The appearance of nonsustainable water user associations, often founded by outsiders, is the consequence. These specious associations do not aim to enforce rules that would minimize the high uncertainty of irrigation in agricultural production. These associations will come and go in the future, but the crucial point is that they destroy the belief of local people in the kind of institutional arrangement that deals with common-pool resources. This exemplifies the self-reinforcement of constraints for collective action.

In particular, information asymmetry as well as the governance of information plays an important role in transition economies. Five possible power strategies concerning the governance of information persist in the villages: (i) distributing information in a directed way, (ii) using only limited information channels, (iii) distributing vague, confusing information, (iv) distributing information late or too late, (v) withholding information. Identifying factors that create incentives for user participation is critical for developing better policies and effectively implementing any devolution policies. As power abuse is identified as an important behavioral characteristic, the distributive consequence of cost and benefit streams of any new institutional arrangement between the actors must be carefully taken into account.

The general attitude toward collective action is pessimistic. Moreover, individualistic behaviors prevail. Distrust and envy are striking characteristics of the rural community. The lack of trust among community members has a crucial impact on the evolution of credible commitment, which is one prerequisite for collective action. These empirical findings suggest that measures must be developed in an effort to increase the restrained initial social capital that fosters a collective action solution. But, given the rather bleak picture of prospects for collective action, the social and human capital creation—two necessities for sustainable and equitable solutions to natural resource management—can only be a long-term process. Medium-term institutional options could be the state management of the irrigation sector with increased participation of farmers in the decision-making process of the state firm ISC or with a stronger involvement of the municipal authorities. Certain management functions could be outsourced to nonstate entities. With regard to the revealed transition-specific features, strengths and weaknesses of those options have to be analyzed in further research.

NOTES

1. The design principles illustrated by long-enduring common-pool resource institutions are (a) clearly defined boundaries, (b) congruence between appropriation and provision rules and local conditions, (c) collective-choice arrangements, (d) monitoring, (e) graduated sanctions, (f) conflict-resolution mechanisms, (g) minimal recognition of rights to organize and, for common-pool resources that are parts of larger systems, (h) nested enterprises (Ostrom, 1990, p. 90).

2. The attributes of a resource leading to increased likelihood of self-organizations are: R1: Feasible improvements, R2: Available and reliable indicators, R3: Predictable flow of resource units, R4: Spatial extent; i.e., given the transportation and communication technology in use, the resource system is sufficiently small that appropriators can develop accurate knowledge of external boundaries and internal microenvironments. Attributes of appropriators leading to increased likelihood of self-organizations are: A1: Salience, i.e., appropriators are dependent on the resource system for a major portion of their livelihood or other important activity, A2: Common understanding of how the system operates and how actions affect each other, A3: Low discount rate, A4: Trust and reciprocity, A5: Autonomy to determine access and harvesting rules, A6: Prior

organizational experience and local leadership have been learned (Ostrom, 2000, p. 40).

3. The "Putnam's Instrument" measures the density of voluntary organizations. With the "Payoff Question," people are asked about the resources they believe they can draw on from friends or will supply to friends in times of need. The "General Trust Question" could be: "Do you think that people in general can be trusted, or do you think that one cannot be too careful in dealing with people? "Network Density Measures" include network maps where individual links are classified according to strength (Paldam, 2000).

4. Here, the term *collective action* was explained by the translator.

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